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VOLUME TWO

NUMBER ELEVEN

U S POST ONE DOLLAR A YEAR

# BETTER FRUIT

*May 1908*



CLARK SEEDLING STRAWBERRIES GROWN AT HOOD RIVER, OREGON

PUBLISHED BY BETTER FRUIT PUBLISHING COMPANY, HOOD RIVER, OREGON



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# BETTER FRUIT

THIS PAGE IS DEVOTED TO THE PROMOTION OF THE WORLD'S GREATEST FRUIT DISTRICT

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THE HOOD RIVER VALLEY

THE HOMESEKER'S MECCA  
FIELD FOR THE CAPITALIST

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There is an unity of action among our growers.

There are good roads, good water, good schools and good neighbors.

You don't have to worry your life out to make a good living for yourself and family.

You will live longer and enjoy life to the utmost in an up to date farming district such as Hood River.

You will save time and money by telling us what kind of a place you want and let us find it for you.

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# BETTER FRUIT

A MONTHLY ILLUSTRATED MAGAZINE PUBLISHED IN THE INTEREST  
OF UP-TO-DATE AND PROGRESSIVE FRUIT GROWING AND MARKETING

## ANOTHER VIEW OF MOTH AND SCALE SPRAYING

BY B. F. HURST, BOISE, IDAHO

THE Idaho Legislature last year passed a law by which it became unlawful to sell or give away any worm-marked or scale-marked fruit; and, realizing the great loss that this means to all orchardists here, I began a close study of the codling moth by which I hoped to determine the best method and the time for spraying for it.

I found that not all the moths came out from their winter quarters at the same time, there being a difference of over three months. I found my first moth (on the south side of the tree) April 30th. The moths on the north side of the tree were three weeks later coming out. When a tree with smooth bark sets in a low, flat piece of ground the worm finds his best hiding place for winter on the trunk of the tree beneath the surface of the ground, and it does not come out until two months later than the one which makes its winter home on the south side of the rough-barked tree. From worms that hide under the floor of the packing house the miller does not come out until three months after the first one spoken of.

In the article by Mr. George W. Taylor in the November number of "Better Fruit" his observations are all based on worms taken from the packing-houses and as my observations were all made from worms taken from the south side of a rough-barked tree our dates do not coincide. The climate being different in the two localities also makes our reports differ in some things. In this locality we usually have warm, dry springs, while I believe that the weather is colder and it is somewhat damper in that

locality. This you can readily see would make quite a difference in the time that the first moth appears.

The greatest number of millers of the first brood came out in my section May 23. I consider that 90 to 95 per

eggs and on the apples five, making practically 89 per cent on the foliage and 11 per cent on the apples. At various times during the summer, upon examining the relative number of eggs laid on foliage and apples, I found that fully 80 per cent are laid on the foliage.

Making a note of where the worms entered the apples, I found that in thirty-one clusters the distribution was as follows: Nine had entered the calyx, twenty-one had gone into the side of the apples and seventeen had entered the apple where it rested against another. On July 10 I picked all of the wormy apples off of one tree in the center of a seventy-acre apple orchard. I found that 297 worms had gone into the calyx and that 228 had gone into the side of the apple where the apples touched.

In August, in a ten-acre orchard where there were only ten or twelve trees that had apples on them, and those had only a few, I found that as many as twelve worms would enter the side of one apple and two in the calyx of the same apple. In my study of this phase of the question during the summer I came to the conclusion that about 52 per cent entered the calyx of the apple and that 48 per cent entered the side of the apple.

After the eggs have been laid on the foliage and the apples have all been removed from the tree, some of the worms have been found to enter the end of the fruit spur where the leaf-buds start, and remain there until full grown.

In studying the habits of the worm I found that from eighteen to twenty-two days after he enters the apple he comes to the surface either where he went in

### CONTENTS

ANOTHER VIEW OF MOTH AND  
SCALE SPRAYING

A DESCRIPTION OF THE PAYETTE  
VALLEY, IDAHO

SEVERAL INTERESTING SPRAYING  
EXPERIMENTS

HOW TO CONTROL APPLE BLOTCH  
AND BITTER ROT

A FEW EXPERIMENTS WITH  
SPRAYING OUTFITS

DOINGS OF FRUIT GROWERS OF THE  
NORTHWEST

THE FIRST FRUIT TRAIN A  
PHENOMENAL SUCCESS

ELIMINATION OF FIRST SPRAYING  
FOR CODLING MOTH

SOME POTENT FACTS ABOUT THE  
CODLING MOTH

cent of the eggs of the first brood of millers are laid on the leaves clustered around the apple.

On the last day of May, when the worms were beginning to go into the apples, I took thirty-one clusters of apples and leaves and counted the eggs on them. I found on the leaves forty



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J. L. Dumas, Proprietor. One hundred acres, trees 9 to 12 years old; product, 1907, 34,000 boxes (bushels) first grade winter apples.



or at some other place. He does not leave the apple at this time, but goes back into it until the thirty-second day from the time he first entered it. The night of the thirty-second day he leaves the apple.

In referring to the article by Mr. Taylor again you will notice that he says that the life of the worm in the apple varies from sixteen to thirty-one days. At first I found this a hard point on which to come to any conclusion, as I put over 500 worms into apples and found the time varied as much as he did. After considerable experimenting I found that some of the worms were two weeks old and some were just hatched. They seem to grow very slowly the first week of their lives and so it is hard to distinguish the youngest ones. I cut open 100 apples and took four of the smallest worms out and placed them upon the apple. These all came out the night of the thirty-first day. I repeated this experiment and found it worked out the same each time, and counting that the worms must have been at least one day old when I cut them out I came to the conclusion that the night of the thirty-second day they came out of the apple and came down the limbs to a hiding place. But they did not come down their spinnerette to the ground. After reaching their hiding place they begin to spin their cocoon. In the warm weather of July or August they are transformed to the pupa stage in three or four days. The day before they are transformed they open one end of the cocoon. They remain in the pupa state twelve days, at the end of which time they come out of the open end of their cocoon, still in the pupa state. The moth then emerges almost immediately and flies away. When the end of the cocoon is opened by the worm the day before it is transformed into the pupa state, this point is left unprotected, and a natural enemy often goes into the cocoon at this point. As the worm is stupid, the enemy neither

kills the worm at once or eats it up later, while it is in the pupa state. This natural enemy looks something like the worm itself, but it has a flatter body with only six legs, which are near the head and which are fully twice as long as those of the worm. In color it is much darker than the worm, especially its head, whose snapper-like mouth reminds one of a lobster's claw. It

thirty years old, which has never been sprayed for codling moth. These natural enemies this past season have destroyed hundreds of worms in this orchard.

I find that there are four different colored moths. The black moth is the female. The male is somewhat larger, of a slightly lighter color, with a large reddish brown spot on the back between the head and wings. There are also a male and a female of a bright golden color, although there seem to be only about one-fourth as many of these as of the darker colored ones. The small worms are the females, and the big long worms are the males.

I put a mosquito bar over a tree and fastened it well around the body of the tree so that I was able to watch the working of the millers. I found that the millers spent the day in the thickest clusters of leaves, where it was dark. About sun-down they seemed to be very busy flying around. I suppose the eggs were being laid at this time. My first millers were put under this net on July 10. In fifteen days the worms were going into the apples and in thirty-two days they were coming out of the apples. From the 110 worms that came out of the apples on this tree, there was not one miller. This proves, to my way of thinking, that there are but two broods of codling moth in one season.

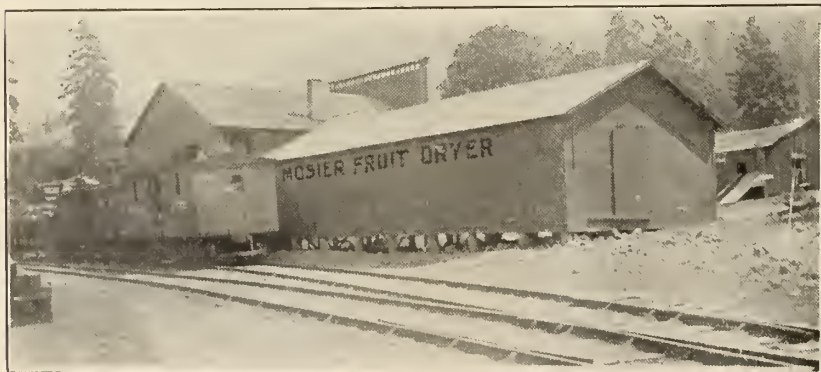
The worms of the first brood go into the apple from May 15 to September 1. By this we may see that the second brood of worms from the last part of the first brood would not enter the apples until the first part of November and would not be matured until December. This fact was proved conclusively because there were only two broods on the tree which was covered with the mosquito bar, and also by the closest observation of their workings

in our own orchard this last season. As for the worm coming down its spinnerette I took thirty-five worms from under bands and out of apples and placed them on a limb. Then I pushed them off with a pencil. Out of all these not one reached the ground, as each one caught itself on its spinnerette before reaching the ground and climbed back on it to the limb. The worm does this by holding on by its mouth while it throws its front feet upward and catches hold; then it lets go with its mouth and stretches up and catches hold of the web with its mouth again. In this way it will climb one inch in two minutes. A codling moth has six legs near the head and eight pro-legs in the center of the body, and two pro-legs at the end of the body.

In experimenting with banding the tree I found that if the trees are banded, a strip of heavy cloth and fuzzy, four inches wide and three or four feet long, according to the size of the limbs, should be used. The band should not be put on flat. This makes a neater appearance, but it does not have the same effect. The band should be rolled around



THE WAY BEN DAVIS GROW IN VINELAND, LEWISTON-CLARKSTON VALLEY



FRUIT DRYER IN USE AT MOSIER, OREGON



so as to catch more worms. A band should be placed around each limb close to the last small limb nearest the trunk. In this way the worm can never reach the trunk of the tree. The bands should be removed every fifteen days. It is not necessary to examine the bands and kill the worms under them oftener than every fifteen days, as this is the shortest time in which they are transformed. If the weather is cool it may be a much longer period. Last July I put bands all over one tree in the center of a seventy-acre orchard. The result was as follows:

The first week in July I got three worms.

The second week in July I got seventy-one worms.

The third week in July I got fifty-three worms.

The fourth week in July I got fifty worms.

The first week in August I got forty-one worms.

The second week in August I got thirty-three worms.

The third week in August I got sixteen worms.

The fourth week in August I got forty-one worms.

The first week in September I got thirty-four worms.

The greatest number of worms that went under the bands in one night was on the night of July 9, when thirty-two went under. From the time a worm goes under the bands until its offspring goes into another apple is thirty-one days.

As I mentioned in the first part of this article, I found my first miller April 30, and as the trees were in full bloom at this time here, I cannot concur with Mr. L. D. Harris in the opinion he expressed in the November "Better Fruit," in which he says the date of the hatching of the first moth is from twenty to thirty days after the petals have fallen. I can readily see that the difference in the climate of the Boise Valley and the Rogue River Valley might be in some degree accountable, as the moist climate of the latter forces the tree to come into blossom sooner and retards the appearance of the moth.

In regard to spraying for the codling moth I would not recommend anything but the arsenate of lead, as you cannot hurt the foliage by a long-continued spraying with it, and also because of its lasting qualities.

Instead of using a platform and spraying down I have found it more satisfactory to use a ten-foot rod, with two Bordeaux nozzles attached to a half-circle. By using an elbow one of these is made to spray directly down and the other one sprays up. I use a pressure of 150 pounds—furnished by a gasoline engine.

You can see by the foregoing conclusions that I can not indorse entirely either Mr. A. L. Melander in his article in the January "Better Fruit" or Mr. Harris in his article just mentioned.

The real question, to my mind, is all solved when we have determined where the worm has been hatched and begins to eat. By my experiments I found that 80 to 90 per cent of the eggs were laid on the leaves near the apple, and this being the case, they must be destroyed on the leaves. If the worm is not killed on the foliage and he ever reaches the apple, or, if the egg is laid

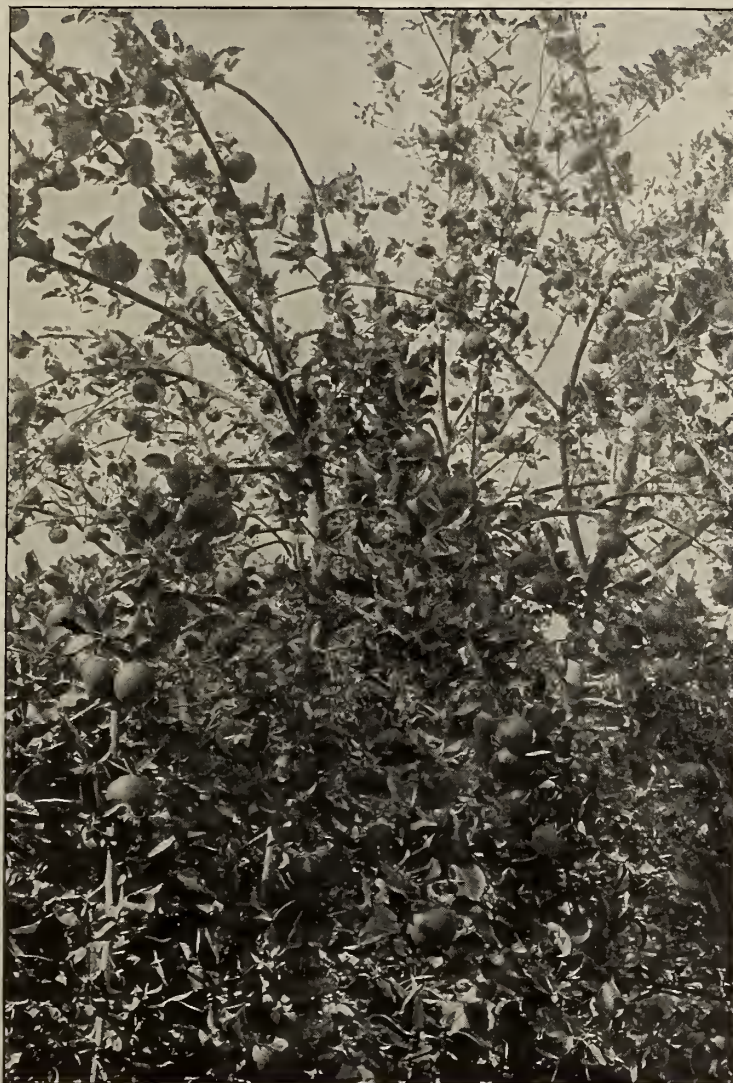
would recommend a third spraying about July 1st to 5th. The poison put on these leaves at this time stays until they drop, and as the miller never lays eggs on the foliage made by the new growth, all the worms that hatch later are killed by this spraying, and more spraying is unnecessary. I have been experimenting with sticky fly paper to be used in the place of cloth for the bands. These

experiments proved very satisfactory, as I caught as many as fifty worms in one night on a badly infested tree. If the mixture that is put on the paper could be bought by the gallon and applied directly to the trees, all worms could be prevented from finding a hiding place and, also, ants could be prevented from coming up the tree, as neither one can cross the sticky fly paper.

If the sticky fly paper is put around the tree with the sticky side out and tied at the top it will catch all the worms that come down the limb for one week, and the birds will clean all the worms off the paper each day. If the sticky side is turned in and left open at the top, like a funnel, it will catch all the worms for two weeks, but the birds will pick through it to get the worms, and so destroy it. As ants fight the natural enemy of the aphids, the catching of the ants by means of the sticky fly paper will also mean the destruction of a great portion of the aphids by means of their natural enemies.

I think that this will prove the greatest means of eradicating the codling moth yet known. For if all of the first brood of worms are caught there would be none (or few) left from which the second brood could start. The only worms that escape are those that drop in wormy apples, and not all apples that fall to the ground have worms in them. In observing this point during this last season I found only one apple with a worm

in it out of the 200 fallen wormy apples that I examined. These experiments led to the discovery of the manufactured article known as the "Tree Tanglefoot," which is much the same as the sticky part of the fly paper. It comes put up in one pound, four pound, ten pound



SPY IN AUGUST, 1907; TWO MONTHS OF GROWTH STILL TO COME. These were grown in Lewiston-Clarkston Valley in a seven-year-old Vineland orchard. The spots on the fruit are spray, which fall rains will remove.

on the apple and he hatches there, the apple must necessarily bear the worm mark and the apple will, according to our law, be unsaleable.

Therefore I consider the covering of the foliage the most important part of the work. But to do away with the worm, that he may have no chance for reproduction, I would recommend an early spraying, by which the calyx is filled (as spoken of by Mr. Melander) just after the petals have fallen, so those that do enter the calyx (which is about six per cent) may be killed. The second spraying, about the first to the fifth of June, should thoroughly cover the leaves and also small apples. Now, for fear that the leaves on the fruit spurs are not full grown, I



PAYETTE VALLEY, IDAHO, APPLES READY FOR SHIPMENT



and twenty-five pound cans, at a cost of about 20 cents a pound, which would not make it cost much over 5 cents a tree by getting it in large quantities. It is applied to the trunk or limbs of the tree with a paddle, and can be put on about as quickly as a band could. It will catch all the worms that come down the tree for three months, and it is recommended for ants, Egyptian moth and Canker worms. This would do away effectively with the later sprayings. The California and Massachusetts experiment stations have both used it and say it is not injurious to the tree.

When I first began to spray for San Jose scale, I took contracts to kill all scale or charge nothing. I soon found

my knowledge, been able to compete with the pest as the lime and sulphur spray does.

#### Formulas

[Note.—The analyses of the following were furnished by Mr. R. R. Gibson, Idaho State Chemist.]

#### Formula Number 1

Put 70 pounds of sulphur in a 50-gallon barrel. Add 8 gallons of water. Mix to a batter. Add 70 pounds of lime and 12 gallons of water. Stir thoroughly. Cover with 6 sulphur sacks and allow it to stand 1 hour. The analysis of this formula is as follows:

Sulphur .....18.7 per cent  
Calcium as lime..... 9. per cent

tions of 11 gallons of water to 1 gallon of Rex. Analysis shows:

Sulphur .....25-12 per cent  
Calcium as lime..... 1 per cent

#### Formula Number 6

Put 3 gallons of cold water in a 50-gallon barrel. Add 70 pounds of sulphur. Mix with a hoe for ten minutes in order to dampen the sulphur. Add 5 gallons of water. Stir until you get a smooth batter. Add 40 pounds of lime and 12 gallons of water. Stir thoroughly once more. Cover with carpet so that no steam may escape. Add 10 pounds of lime every 20 or 30 minutes until 100 additional pounds (making 140 pounds



STREET SCENE IN WHITE SALMON, WASHINGTON, A NEWLY DEVELOPING FRUIT DISTRICT

that this was a very difficult matter and far from profitable, and after experimenting I found out what the trouble was. I found that while right proportions were essential, still the thing which counted most of all was the way in which the ingredients were put together. Of course, it is possible to use the right materials and mix them properly without killing the scale, because the experimenter may fail to cover the tree properly. But my observation has been that the trouble most orchardists have, is in the preparation of the spray. For this reason I wish to give the results of several experiments which I have recently made along this line. I cannot state too emphatically that so far as my experience goes, no other spray will have an effect on the San Jose scale than the lime and sulphur. I am aware that a good many other sprays have been advocated and that some of them are recommended by high authorities. But none of these sprays have ever, to

#### Formula Number 2

Put 70 pounds of lime in a barrel. Add 70 pounds of sulphur and 20 gallons of water. Mix well, cover, and allow to stand 1½ hours. The analysis of this formula is as follows:

Sulphur .....6.4 per cent  
Calcium as lime.....3.4 per cent

#### Formula Number 3

Take the material formed by No. 2. Pour it into a tank. Add 70 pounds of lime. Cook 1½ hours. Dilute with enough water to make 200 gallons when using on trees. Analysis will then show:

Sulphur .....3.8 per cent  
Calcium as lime.....2.3 per cent

#### Formula Number 4

This is the "Rex Lime and Sulphur Solution" as drawn from the barrel. Analysis shows:

Sulphur .....28. per cent  
Calcium as lime.....10.4 per cent

#### Formula Number 5

This formula is the "Rex Lime and Sulphur Solution" diluted in the propor-

in all) have been put in the mixture. Analysis shows:

Sulphur .....26.5 per cent  
Calcium as lime.....11.3 per cent

#### Formula Number 7

Dilute Number 6 with enough water to make 250 gallons. Analysis shows:

Sulphur .....4.3 per cent  
Calcium as lime.....2.3 per cent

This is the strength that was used on the trees.

#### Formula Number 8 (California Formula)

Put 40 gallons of water in a cooking tank. When brought to the boiling point add 140 pounds of lime and 70 pounds of sulphur. Cook one and one-half hours. Dilute with 160 gallons of warm water. Analysis shows:

Sulphur .....3.8 per cent  
Calcium as lime.....2.4 per cent

This is the strength as it was used on the trees.

#### Some Notes on the Preceding Formulas

In experimenting with formula Number one, I first saw the sulphur should



be dampened before the lime was added. This prevents the sulphur from lumping. In this way, and in this way alone, can the whole amount of sulphur be made soluble. Ignorance of the necessity of dampening the sulphur first has caused a great waste in my experiments and has, I consider, cost me hundreds of dollars for extra material which might as well have been saved. Sulphur should never be put in hot water nor in a large quantity of water.

In spraying over our own orchard, the material cost us more than \$700. I consider that we lost at least \$200 worth of sulphur because of improper cooking in the tank, since I did not discover the device of cooking it with the lime

will observe, is the same per cent as the California formula.

The Rex (formula Number four) is the strongest solution of soluble sulphur that can be obtained.

In using the formula Number six we did not use the best quality of lime and sulphur. If we had done so, the analysis would have been equal to the Rex or formula Number four.

In formula Number five, the Rex diluted is, in my opinion, too weak to kill the San Jose scale; but if it were diluted in the proportion of six gallons of water to one of Rex would, I should think, be sufficiently strong.

Formula Number seven (Number six diluted) I consider much the best, for

made a few improvements in this which I shall term formula Number nine. This is the most practical for the man who sprays on a large scale.

#### Formula Number 9

Take six fifty-gallon barrels. Put in each three gallons of cold water and seventy pounds of sulphur. Mix with a hoe for ten minutes to each barrel to get the sulphur thoroughly dampened. Add to each barrel three gallons more of water. Mix two minutes. Add four gallons more of water to each barrel. Mix one minute. Then add fifty pounds of lime to each barrel and twelve gallons of water. Stir thoroughly. Cover with carnets or sacks so that no steam may escape. If it starts to boil



New High School-Ashland



State Normal-Ashland



May Day at Normal



West School-Ashland

#### SCENES IN ASHLAND, A PROSPEROUS CITY PARTLY SUPPORTED BY THE FRUIT GROWING INDUSTRY IN SOUTHERN OREGON

in the barrels until the winding up of the spraying. But I have used the spray I have suggested enough to know to a certainty that it is perfectly satisfactory. Badly affected trees had not a live scale on them in two weeks. Our state chemist says that any portion of the sulphur that becomes lumpy, whether small or large, remains insoluble, no matter how long you may cook it.

You will notice that in formula Number two the same amount of lime and sulphur was used, but that the analysis shows that formula Number two is only about one-third as strong as formula Number one. This was due to the fact that the sulphur being put in the barrel of water, dry, became lumpy, and also to the fact that the full benefit of the cooking power of the lime was not gotten, because the sulphur floated on the surface of the water.

In formula Number three the per cent after diluting to a quantity of 200 gallons is nearly as strong as that of Number two undiluted. The extra strength is caused by the additional seventy pounds of lime and the one and one-half hours' of cooking. This, you

two reasons. First, the cost is not so great. If the Rex were diluted in the proportion of one to six, as mentioned above, it would take thirty-five and five-sevenths gallons of Rex to make 250 gallons of spray ready for the trees. In Boise this amount would cost \$8.91. On the other hand, the spray made by formula Number seven costs only \$3.85 for 250 gallons. In the second place, formula Number seven makes a better coating for the tree, because of the excess of lime, which has a tendency to prevent other diseases from getting a foothold.

Formula Number eight (the California formula) has been the accepted one for San Jose scale in the west for several years. But in this formula a certain per cent of the sulphur remains insoluble because the sulphur was added to hot water. The expense of following this formula is also to be considered, as it necessitates at least two large cooking tanks and the fuel necessary for the cooking, besides one extra man's time.

You will join with me, I feel sure, in saying that formula Number six is the best so far offered. But I have

out of the barrel, add a little cold water on top of the covering to check it. Now take two fifty-gallon barrels and put in each 200 pounds of salt (one gallon of water will absorb exactly three pounds of salt). Fill the barrels with water (warm water preferred) and stir thoroughly. If stirred occasionally it will be ready for use in two hours. It may, however, be allowed to stand any length of time, as each gallon of water will take up only three pounds of salt. Now weigh out separately ninety pounds of lime for each barrel. Add this in lots of five or six pounds every half hour, if convenient, for about two hours. In doing this it is better not to uncover the whole barrel. It is not necessary to stir the mixture at all. Merely lift the cover at one side sufficiently to add the lime. At noon add about ten pounds more and at night ten pounds more. Add ten pounds at morning, noon and night of the next day. Add ten pounds more on the morning of the third day and at noon on that day add the last six pounds. Then add to each barrel ten gallons of the salt water and dilute with

Continued on page 28.



## A DESCRIPTION OF THE PAYETTE VALLEY, IDAHO

THE advent of the railroad into the heart of the Payette Valley, with its present terminus at the very attractive little village of New Plymouth, has in one season literally turned the face of the earth upside down. The fields of alfalfa and clover which followed the first crops of grain on the newly cleared sage brush land during the settlement period of the past five years have now been turned under, and with this best of fertilizing, is now producing astonishing crops of sugar beets, averaging in many cases from twenty to twenty-five tons per acre, a few fields yielding even greater tonnage, an average of \$30 per acre clear, after paying all expenses, being considered a fair revenue, although double this amount was cleared last season by several farmers in the vicinity of New Plymouth and Fruitland, and one man netted \$76 per acre. The raw land from which these valuable and sure crops are now realized was purchased less than five years ago at from \$35 to \$40 per acre, including water right, and was then twelve to fifteen miles from railroad, while today the remaining few hundred acres of unimproved land, located from two to five miles from New Plymouth, can be purchased at from \$45 to \$50 per acre. Not so, however, with the improved lands. These have steadily advanced in price in proportion to the revenue derived from each successive crop, until many of the forty and eighty-acre tracts are now a profitable investment at from \$100 to \$200 per acre, some smaller tracts having been sold at \$250 to \$300 per acre during the past six months.

The rich harvests and the rapid development of the New Plymouth bench under irrigation is in striking contrast to the apparently worthless sage brush plain so recently transformed by the bringing together of the elements of success—rich soil, abundance of water, Idaho sunshine and 'the man with the hoe.' For the modern homeseeker, who no longer seeks the privations and hardships of frontier life, but a community or

settlement replete with modern conveniences, telephone, rural mail delivery, electric light and power, good schools and churches and a vigorous and healthy atmosphere in which to develop the minds and bodies of his children and young people, and those who desire to engage in business, profession or manufacture, the towns of New Plymouth, Fruitland and Payette are certainly ideal, and in the Payette Valley capital will always find an attractive and profitable field for investment.

◆ ◆ ◆  
CHELAN County Horticultural Society recently held a very interesting and profitable two days' meeting, at which profitable and valuable papers were read on spraying, pruning, packing, pear blight, and other subjects pertaining to the fruit business, all of which were followed by animated discussions. During the convention it was found that a unanimous sentiment existed among the members present favoring a rotation of the meetings of the society among the different fruit growing districts in the county, thus making it more convenient for growers from all parts of the county

to attend and give them the opportunity of having at least one meeting near their homes. It was decided to hold meetings at Cashmere, Entiat and Chelan. One of the largest meetings was held by the stockholders of the Wenatchee Valley Fruit Growers' Association, at which it was unanimously voted to increase the capital stock of the asso-



WATER WHEEL ELEVATING WATER FOR IRRIGATION IN THE PAYETTE VALLEY, IDAHO

ciation from \$15,000 to \$50,000. In the election of the directors the old board was retained and M. O. Tibbitts chosen president; M. M. Horan vice-president, and E. T. Balch secretary.



THE KIND OF PEACHES GROWN NEAR ALBANY IN THE WILLAMETTE VALLEY, OREGON



# SEVERAL INTERESTING SPRAYING EXPERIMENTS

BY PROFESSOR L. F. HENDERSON, OF THE IDAHO EXPERIMENT STATION

**A** FEW points had not been settled during our former experiments, and it was our purpose to try to settle these in 1907. These several points may be summarized as follows:

1. Are commercial lime-sulphur mixtures as good as home made?

4. Does bordeaux, well made, injure the apple when applied at flowering time, and why?

5. Can arsenate of lead, made at home, give us as good results as a well-made commercial article?

6. Can the amount of arsenicals be greatly reduced over the advertised proportions and give as good results?

7. What is the relative value of the dust spray compared with liquid sprays in the treatment of both apple scab and codling moth?

Three different parts of the state were selected in an attempt to demonstrate these several points. The scale experiments were carried on in Southern Idaho, near Meridian, while the other two were in Northern Idaho.

## San Jose Scale

Though I had demonstrated sev-

eral of these points in respect to scale in and about Lewiston during the previous season, there were some which I had not carried out at all, while several which I had proved to my own satis-

faction in North Idaho were either doubted, seemed to work differently, or did work differently in Southern Idaho. I therefore resolved to put in my final work on scale in the territory tributary to Boise, and selected two very fitting orchards near Meridian. These two belonged, the one to Messrs. Flack & Sons, the other to Mr. J. A. Watt, leased and run by Mr. Barbee. I may add that it rained so much during the time of these experiments, March 15-23, that I feared greatly for their success. In fact, in referring to my notes, I find that there was not a day nor a night, while actually engaged in the spraying, that it did not snow or rain, the showers being generally very severe. Friday and Saturday, March 15th and 16th, were spent in platting the orchards on the two places, in preparing material and getting together suitable spraying equipment. Rain prevented any spraying Monday or Tuesday morning, and the trees were barely dried of rain in the afternoon when I began the first application.

## Experiments in One Orchard

The trees in this orchard being smaller and less scaly than in the other, I determined to try every mixture here, and duplicate but a few of them in the Flack orchard, for reasons which will be given later. The sprays used here were as follows:

1. Scalecide, 1-15, and 1-20.
2. California spray applied luke warm.
3. California spray, applied boiling hot.
4. Piper, or 1-1-4, formula.
5. Niagara spray, made in Portland, Oregon.
6. Rex spray, made in 1907.
7. Rex spray, made in 1906.

The part of the orchard selected for spraying consisted nearly entirely of apple trees. One peach tree was sprayed, which was obviously scaly, and one or two very scaly pear trees. The balance of the orchard, consisting of pears, prunes, peaches and plums, was later sprayed by Mr. Barbee himself, and was not considered in this experiment. The apple trees were practically in a square, twelve trees each way, or 144 in the orchard. As a fact there were less trees than that, for Mr. Barbee was engaged in pulling out one full row as I reached the place, while at that time or afterwards he pulled



PAYETTE RIVER, IDAHO, FROM WHICH WATER IS TAKEN TO IRRIGATE THE VALLEY

2. What is the value of scalecide as a spray for San Jose scale?

3. Does the addition of salt aid the lime-sulphur mixtures when spraying for Peach-leaf Curl?



IRRIGATED SECTION IN THE PAYETTE VALLEY, IDAHO



out many individual trees, which were nearly dead, or of poor varieties. The 128 trees left were of eight main varieties and a few scattering ones, but as no difference in infestation was apparent due to varieties, no further account was taken than to see that some of every variety were sprayed by every spray. A more important thing, however, was to note the degree of infestation of every tree sprayed in both orchards. So, to be sure of things when I returned to to check up the orchard May 31, I platted every tree in its proper place, noted the variety of the fruit, and used ordinary minute marks (') to note the degree of infestation. Each tree was represented by a cross, and the minute marks used would express infestation as thus:

X Tree with no visible scale.

X' Tree with slight scale.

X'' Tree with some scale, but not much.

X''' Tree with much scale.

X'''' Very scaly tree.

Where trees were in broken rows I showed it on the plat, and where the trees were entirely out of rows or in very irregular rows, attempted to give these also their relative positions on the plats. The importance of all these details cannot be too much emphasized where one is using several sprays, each spray covering but a few trees. Another thing which I thought would materially interfere with my results, unless the utmost care was used to prevent it, was the violence of the wind which prevailed during one whole day in this spraying. This accounts for the amount of spray apparently wasted in spraying these few trees. The only way I could know that I was covering the tree on the leeward

side was to bring the nozzle as near the tree as possible and spray against the wind, stopping whenever I could see that much of the spray was being carried to any near tree on which any other spray had been used. In the face of so many difficulties I think the results were rather remarkable.

#### Method Used to Determine Efficiency

It has often occurred to me

that it is a very serious problem to determine just how great a proportion of the scales is killed by each spray. You cannot simply take all the scales containing no live insects into your calculations, for many of these, in well infested trees, are already dead, and simply hanging in place. Neither, on the other hand, can you say that every live scale you find later in the season withstood the spray, as the spray may not have touched it. Poor spraying accounts

any one who proposes to count the number of scales killed in any area, I determined to adopt a different method. I devoted my enumerations entirely to the little, black, new scales, which by many observations with a good compound dissecting glass I had found in these two orchards, and as far as I had observed elsewhere, invariably alive, as well as to such older scales as might be with them in open, exposed places and free from other overlapping scales. In this



HOME OF A FRUIT GROWER AT WHITE SALMON, WASHINGTON

for much of this supposed immunity. Then, many of the old scales are completely overlapped by others, while many are placed under projecting bark and in small crevices, into which the spray cannot penetrate. No spray with which I am acquainted will kill all of the live scales in a much infested orchard, simply for the reason that no spray will reach every scale. These being some of the difficulties that confront

way, and in this way alone, it seems to me, one can absolutely know the proportion of scales he kills with his spray. No old scale was counted as killed by the spray unless her body showed recent death.

#### The Several Sprays and Results

Scalecide—This material had been sent me with high endorsements by the makers, while the bulletins of many sta-



MELON FIELD IN THE PAYETTE VALLEY, IDAHO



tions had given it a good name. Some writers had said that it would "kill all scale" at the proportion of one of scalecide to nineteen of water, while the makers and several station men recommended rather one to fifteen. I tried both.

**Rex and Niagara Sprays**—Both of these are commercial mixtures of lime-sulphur, the first made (then) in Omaha, Nebraska, the second in Portland, Oregon. Both of these sprays had received

and have its work observed by others there, since in this part of the state it had received most severe criticism. This latter spray is composed of one pound lime and one sulphur to each four gallons of water. Further discussion of this spray can be found in a bulletin published by our station last year.

#### Experiments at Flack Orchard

The orchard on this place is mainly of very large trees, of several kinds of

fruit, including apples, pears, cherries, apricots, peaches, plums and prunes. The apricots showed no San Jose scale, nor did the sour cherries, both trees being nearly always in our country immense. Many of the other trees were enormous, their upper branches could only be thoroughly

reached by spraying from the wagon and from ladders. Hardly a tree was free from scale, while some were so infested as to appear gray at considerable distances. The scales were, on almost all of the trees, so numerous as to overlap one another, thus making their killing very difficult. Let me say in justice to Messrs. Flack that these trees were in this condition when they recently bought the place, and that they are showing praiseworthy zeal in trying

to get rid of them. As before remarked, it was mainly for these two reasons, size of trees and crowded condition of scales, that I determined to duplicate our experiment, at least as far as the California, Piper and Rex sprays were concerned. About ninety-five trees were sprayed by us in this experiment, and these were of six different fruits, but mainly apples. A few, supposedly from the inroads of the scale, were nearly dead. A few were so infested that no part of the bark could be seen for scale.

#### Results and Conclusions

On May 31st I returned to check up results, bringing with me a fine dissecting glass. A table and chair in both cases were carried out into the orchard, and thus, using both hands with the needles, I could be sure of every scale examined, no matter how small. Each tree was examined and finished before another was touched. In doing this, many small strips were cut from the trees in various places, some where the limb or trunk would be fully exposed to the spray, while others were cut from the under sides of limbs or from places where two limbs or a limb and the trunk came together. This would give two extremes, the places reached most easily by the spray, as well as those reached with most difficulty. I shall now give the results of these examinations on each tree, giving variety of tree, and spray used. I shall give the Flack orchard first as I began my observations in this orchard. It must be borne in mind, as before explained, that in these countings I considered only the small, black scales which had been seen to be all alive in March, together with whatever old exposed scales could be found alive or recently dead. No scales, where the insects would break readily under the needles, were counted, as it was most likely these had died prior to the spraying. Of course no empty scales were considered at all.

#### Conclusions

1. All sprays used, at least in my experiments, show about equal and very high killing efficiency.
2. Scalecide 1-20 does not kill enough scale. At 1-15 it kills scale as well as any spray, is pleasant to handle, covers the tree quickly with its oily coating and mixes easily and readily. Were its cost not far in excess of home-made lime-sulphur sprays, and even twice that of the commercial articles, it would be the most desirable agent I am acquainted with in getting rid of this pest. In spraying a few trees or bushes for scale, I should buy it in preference to any other spray, owing to its non-corrosive character and ready mixing.
3. Salt added to lime-sulphur sprays is useless.
4. Sprays containing less sulphur and lime are just as efficient as California spray.
5. Where trees are small and scales separate from one another, any of these sprays will kill practically all scales.
6. Where trees are enormous, and hard to cover and offering many rough places, and consequent hiding places for the scale, no spray is likely to kill all the scales.
7. Where scales are massed so as to cover one another, the



FRIEND SPRAYING APPARATUS FOR REACHING HIGH TREES

severe criticism in some quarters, especially in Southern Idaho, so I wished to pit them against the other sprays in this locality. My reason for trying the Rex twice was to see whether it lost in killing power when over one year old, as many, myself included, had feared.

**California and Piper Sprays**—Though I had tested these two sprays in Northern Idaho and had been entirely satisfied with the Piper or more diluted spray, I was desirous of testing it in the south,



A VINELAND ORCHARD, LEWISTON-CLARKSTON VALLEY, 1907  
First crop of Newtowns (fifth season), four and one-half years from setting.



undermost scales are not all touched by the spray, and consequently not killed.

8. For trees in either of these two last classes it will be found most beneficial to give two sprayings, one in the late fall, and one in the early spring.

#### Mixed Sprays for Codling Moth and Apple Scab

In the two previous seasons I had proved that three sprayings with Bordeaux are sufficient for the worst attacks of scab we have ever had in this country. I had also shown that it is

orchards, whether sprayed or unsprayed, so that we were forced to take consideration only of the codling moth. Then, in the month of July we had several tremendous and unprecedented storms, which must of necessity largely have affected the amount of codling moth. For the first time in my fifteen year's experience in this country a perfect deluge of rain fell, accompanied by hail of great size and of unusually long duration. The surface soil in many places was carried from the orchards, baring the roots of the trees, while the

sors Hedrick and Hall. This year, luckily I had beautiful warm, sunny weather at time of the calyx spraying, so this year at least neither rain nor wind could have had anything to do with the injury. Instead of spraying the whole orchard, as I had the year before, with Bordeaux plus the arsenical at this time I selected about six or eight trees of each of the four varieties of apple, Rome, Johnathan, Ben Davis and Gano, and these I sprayed with Bordeaux plus arsenate of lead, while the rest of the trees in several acres I sprayed with the



WASCO COUNTY, OREGON, FRUIT EXHIBIT AT THE LEWIS AND CLARK FAIR, PORTLAND, OREGON

early enough to commence these sprayings just as the first color is showing in the apple buds, that is as the flower buds are beginning to separate from one another in the clusters. My previous two years' experience with the arsenicals, in combating codling moth had told me that some good make of arsenate of lead, like Swift's, had killed most worms, followed closely by home-made arsenate of lead, Paris Green, Kedzie's Soda, Arsenite of Lime, and Taft's Arsenite of Lime. There were many problems connected with the subject which I had not solved to my satisfaction, and these I hoped to clear up this season. These problems I have mentioned at the beginning of my article, and I shall not repeat them save as I come to them.

I may right here say that we had almost no scab this year in any well-kept

hail-stones were so large that hardly a tree or an apple escaped some injury. I considered this so large a factor in the destruction of moth, eggs, and larvae then on the ground that I am unwilling to say what portion of the brood was killed by the sprays.

#### Does Bordeaux Applied at Flowering Time Hurt the Young Apple, and Why

For several years I had noticed that Bordeaux injures the apple when young, but what it was due to I did not know. First I had laid it to the door of excess bluestone over lime or too great a strength of the former in reference to water. Last year when the admirable bulletin on "Bordeaux Injury" was about to appear from the Geneva Station I was inclined to think weather had most to do with this, and so informed Profes-

arsenical alone. I furthermore used the Bordeaux in the strengths.

Two pounds copper sulphate, two pounds lime, 100 gallons water.

Four pounds copper sulphate, four pounds lime, 100 gallons water.

Eight pounds copper sulphate, eight pounds lime, 100 gallons water.

Not two weeks had elapsed before the injury was apparent and it became more and more noticeable throughout the growth of the apple, till at picking time scarcely a fruit was to be seen on any of the trees which was not russeted or even much distorted. Moreover, the injury seemed the same with the weakest as with the strongest mixture. No injury was to be found where the arsenate of lead alone was used. Twenty days after the first spraying with the arsenical we



went over the whole plat again and this time we used on every tree the Bordeaux plus the arsenate of lead. No injury resulted from this spraying, though in every 100-gallon tank I used eight pounds of copper sulphate and eight pounds of lime. When using the first spray for moth I employ a Bordeaux nozzle, on account of the force obtained by it and the coarseness of the spray. I endeavor to spray into every young apple with violence and with abundant spray. While I was spraying this orchard, a neighbor across the way was using the same

as well as to the violent storms. Partial results we did, however, get.

1. The dust spray gave as good results for codling moth this year as did the liquid spray.

2. The per cent of wormy apples in this, as well as in all sprayed orchards, was very low, not one per cent.

3. Unsprayed and uncultivated orchards had a high per cent of loss from codling moth, frequently under my own observations running 75 per cent.

4. While some of our rows of trees did not average a half dozen wormy

5. The weaker sprays, with arsenate of lead, gave us this year about as good results as did the stronger. Whether this would be the case in a normal year I cannot say.

#### Peach Leaf Curl

But one point remains. Does salt add to the efficiency of Rex or Niagara Sprays when used to prevent curl of peach? This may be answered briefly. Several years ago I had used the California wash, with salt, to combat curl in an orchard near Lewiston with good



WHERE ORCHARDS AND TOWN LOTS MEET IN EUGENE, OREGON

spray, Bordeaux plus arsenate of lead, but he used much less spray than do I, while he also employed a Vermorel nozzle, which throws a conical, thin spray of little force. Very few of his apples showed any Bordeaux injury. I am, in the light of another season's experience, inclined therefore to think that the sprayer must do one of two things at the time of first spraying for moth. He must either give a very light and inefficient spraying at this time with Bordeaux and the arsenicals; or if he believes as do I that this is the most important spraying for moth, and therefore should be heavy and forcible, he must leave out the Bordeaux and use it in the ensuing spraying two or three weeks later.

The three other points we had outlined for our experiment:

1. Home-made versus Commercial Arsenates of Lead.

2. Reduction of amount of Arsenate of Lead.

3. Dust Sprays versus Liquid Sprays, were inconclusive owing mainly to absence of fungi in this orchard this year,

apples to the loaded tree, those rows that were next to an orchard which has never been sprayed, cultivated, nor pruned, to my knowledge, gave as high as 50 per cent of wormy apples, decreasing rapidly to less than one per cent as we left the infested orchard, though all of the trees in our orchard had been sprayed three times. It is therefore vain to look for good, clean apples in your orchard, no matter how often you spray, if an indifferent, careless neighbor just over the fence will not spray at all. Such a man should be compelled to spray or have his orchard destroyed by law.

#### A FORMULA FOR MAKING BEST GRAFTING WAX

**T**WO PARTS resin to one part beeswax seems to be the best proportion to use. More or less tallow or linseed oil can be used to render the wax softer or harder, as desired. Adding tallow to a good wax does not bring lumps, if not used in too great quantities. Adding resin to a soft, lumpy wax will render it smooth and applicable. Oil waxes are lighter in color than tallow waxes.

results. Last year I used in my orchard the Niagara and Rex Sprays, of course without salt, and the sprayed trees were as much covered by curl as were the controls. I was much surprised, and this year determined to use salt in some Niagara spray which was sent me from Portland. I put in about seven pounds common salt, first dissolved in hot water, and this year these same trees showed almost no curl at all. Though this experiment is not conclusive, I am inclined to think that salt is essential to the efficiency of this spray, of Rex, and of the Piper spray, when used for curl.

After trying many different formulas for making grafting wax, the Rhode Island experiment station has found nothing better than the common one of four pounds resin, two pounds wax and one pound tallow. For use in early spring, or when the weather is cool, a little more tallow should be used to make it softer. About four-fifths of a pound of linseed oil can be substituted for the pound of tallow.



## HOW TO CONTROL APPLE BLOTCH AND BITTER ROT

THE following article from the National Fruit Grower shows the results attained by Professors Scott and Rorer in their experiments to obtain a preventive for apple blotch and bitter rot in the extensive apple sections of Northwestern Arkansas, covering a period of two years. These diseases had gained a strong foothold there, and threatened the destruction of the apple industry. The timely intervention, how-

between bitter rot and the blotch.) It spreads rapidly just beneath the skin, attaining the size of from one-eighth to three-eighths, sometimes one-half inch in diameter. Where the spots are numerous they often coalesce and form large blotches which may cover half the apple. The fungus grows just beneath the skin, killing the surface cells. The continued growth of the tissues beneath causes cracking of the diseased areas. The

three weeks, beginning from four to six weeks after the petals drop, will effectively control the disease. Untreated orchards will in a few years become entirely worthless.

Orchardists should note the peculiarities of apple blotch and keep close watch of it. The usual spraying with Bordeaux mixture will control it in connection with other orchard diseases for which it is a remedy, but it will be noted that the



ALONG THE BANKS OF THE BEAUTIFUL WILLAMETTE RIVER AT EUGENE, OREGON

ever, of the government experts and their remarkable success in controlling the difficulty, has been and will be of incalculable value to that section and other localities also where these diseases prevail.

The bitter rot is a disease that is well known and has been exceedingly destructive where not treated and left to have full sway. Treatment has heretofore not always proven effective. This was due to a lack of knowledge as to the proper time for the treatment and the thoroughness of it. Since these essentials are fully understood, the disease can be easily controlled.

The apple blotch is comparatively a new disease, although it was first reported by Clinton of Illinois in 1902. Since its first discovery its spread has been rapid and is terribly destructive in its character, not only to fruit, but to the tree itself, as it attacks the twigs, upon which it forms cankers. That it can be controlled has been clearly demonstrated by the experiments of Scott and Rorer. By many it was supposed to be a late form of scab—black scab or star fungus.

The description of the disease given by Professors Scott and Rorer is that "it first appears on the skin of the apple as a minute light brown spot with an irregular margin. (Note here the difference

cracks thus formed usually remain small, but may extend to the core and almost girdle the fruit. Within a few days after the spots become visible, small black dots or Pycindia develop. These dots become quite numerous, they are usually scattered, but often grouped on a little blister. Within these Pycindia are produced numerous small, ovoid, colorless spores, measuring about thirty-five by twenty-four one hundred thousandths part of an inch. These spores are the reproductive bodies of the fungus."

The infection takes place from four to six weeks after the petals have fallen. The disease forms cankers on the twigs or small branches, which have the same general appearance as when formed on the fruit, and upon which the Pycindia are easily recognizable, with the purple appearance and the cracking of the wood. These cankers were found most abundant on wood at the point where last year's apples were attacked. From the Pycindia on these wood cankers there oozed out the spores of the disease, which were readily washed by rains and dews to the adjacent fruit. When the infestation takes place it will require several years to develop, and is most severe in old orchards.

Four thorough applications of Bordeaux mixture, made at intervals of

spraying must be continued later in the season. In the commercial spraying demonstrations conducted there by the government experts the following results were obtained:

### Gepple Orchard

From sprayed plot ninety per cent of fruit was put in barrels, while only thirty per cent of fruit from unsprayed plots was barreled, and these were not as good as the barreled fruit from sprayed plots.

### Geiger Orchard

From one sprayed tree there were nine bushels of good fruit taken, and one and one-half bushels of culls, while from an unsprayed tree there was one bushel of fairly good fruit taken and eleven and one-half bushels of affected fruit or culls.

The experiments were conducted in a number of orchards and covering considerable territory.

Almost the whole world knows of Hood River as a place that produces the best fruits, and all of Hood River Valley should know, and could know, that there is one place in Hood River, under the firm name of R. B. Bragg & Co., that the people can depend on getting the most reliable dry goods, clothing, shoes and groceries at the most reasonable prices that are possible; try it.



# A FEW EXPERIMENTS WITH SPRAYING OUTFITS

BY ANDREW VERCLER, ORCHARDIST, SALEM, OREGON

**D**URING the Oregon State Fair at Salem last September I told Professor E. R. Lake, of the Oregon Agricultural College, that I intended trying to use compressed air with my Niagara sprayer. I told him my plan and asked him what he thought of it; also asked him to do some experimenting at the college, as they have most of the necessary machinery in their shop.

For a number of years after I planted my first fruit trees in Polk county, two and a half miles northwest of Salem, about seventeen years ago, I used a barrel outfit. I put the barrel into a light one-horse rig, wired it fast, then I went down on one side of the row and back on the other, pumping with one hand and holding the rod with the other. I took plenty of time and was very care-

it first to apply the arsenate of lead solution and was well pleased with the results, but the cost of the gas was fully equal to to the cost of the labor for pumping, with the difference that the gas was always ready; but when I used the lime-sulphur spray I had to continually agitate the liquid to keep it from settling; even then there would be a coating found in the rods and nozzles,



VIEW OF AN ORCHARD DISTRICT IN THE HOOD RIVER VALLEY, OREGON

He told me that he thought my plan would work out all right.

After I had proven my plan good by the successful operation of the outfit, I wrote him and he suggested my reading a paper on the subject, and explain my outfit at this meeting.

At first I thought that there was not enough to the subject to warrant taking the time of this meeting, but after being urged by a number of other persons, I wrote Mr. Lake and told him that I would have a paper, and use for my subject, "My experience with spray outfits."

It is conceded by all fruit growers that spraying is absolutely necessary in order to raise marketable fruit, or any kind of fruit for that matter. It is getting so that trees will hardly live in some sections without proper spraying.

Then, as spraying is so necessary a part of successful fruit-growing, it is very important to get a good outfit—one that will do effective work and is durable and easily kept in repair.

For some time many makers and users of spray outfits have been figuring on how to get rid of the ever-troublesome pump, whose leather fittings are a source of much trouble.

ful to cover all of the tree and believe I did effective work, as the trees were small and could be reached easily, but I want to caution all who use the small outfits to be careful, as it is much easier to slight the work than with a larger and more complete outfit.

Those whose orchards are too small to warrant their purchasing a good outfit, should join with one or two neighbors and get the outfit. Most of the small outfits have no gauges and the pumps have short handles, thus making it difficult to have the required pressure.

After my trees grew larger I procured the large size Meyers pump, which has an air chamber of about eight gallons capacity. With this outfit, with either man or gasoline power, one can do effective work and lots of it. I worked my pump by hand, using two men at the pump much of the time, and two strings of hose. Spraying, especially the pumping, is disagreeable work, and as help became scarcer it was sometimes almost impossible to get the necessary help.

Therefore, when the Niagara sprayer was introduced around Salem I hailed it with delight, as by its use I could dispense with the men at the pump. I used

but, by cleaning them each time the sprayer was empty, and using part warm water in the solution, I managed to get along fairly well. I was always inclined though to finish at a low pressure in order to save gas.

Some claim that the gas has a weakening effect on the lime-sulphur solution; however that may be, I will not enter into the discussion of it here, as it is no longer necessary for me to use the gas.

While using the gas and noting the expense of it, I made up my mind that compressed air would do the same work, if the proper machinery were obtained and receptacles to hold the compressed air made. I so expressed myself to Professor Lake and others, among them Messrs. Skaife & Emmett, pump dealers at Salem. They all seemed to look upon the proposition rather favorably and thought it might work, but were more willing that I should do the experimenting.

Experimenting is generally rather expensive work, but I had full confidence in the plan. Messrs. Skaife & Emmett agreed to procure all the necessary parts and machinery for me at cost, so after picking my apples last



October I fitted up the outfit, using the Niagara to hold the spray.

The other parts of the outfit are a small air compressor and two ordinary boilers, the same as are used with ranges to heat your bath water. They are tested at 200 pounds to the square inch. I use a two-horsepower Fairbanks Morse engine to run the compressor.

I fastened down the engine and compressor in my prune dryer. The air



WILLIAM McMURRAY.

General passenger agent of the Harriman Lines in Oregon. Although a resident of Oregon but a short time, Mr. McMurray in his official capacity has inaugurated methods that are doing a great deal to advertise the Northwest and bring investors and homeseekers to participate in its great undeveloped resources.

tanks are each fitted with a steam throttle valve, and the connection between the compressor and the air tanks is fitted with a pressure gauge, so as to show at all times what the pressure is, and



JOHN W. DENNIS

Mr. Dennis is a member of the firm of W. Dennis & Sons, Limited, of London, one of the largest apple handling concerns in that great city. They have for a number of years disposed of many thousands of boxes of high grade Northwest apples in foreign markets, and are known as one of the most successful and solid fruit importing firms in London.

a safety valve set at 175 pounds, so that if no one is there to stop the engine there is no danger of bursting the tanks.

I fill one tank with air, then while we are spraying with that the engine is filling the other, which is filled to the proper pressure when we are ready for it. All that is necessary is to keep the engine properly oiled and supplied with fuel. It costs between twenty-five or thirty cents a day to furnish the air.

In securing a spray outfit, one should take several things into consideration.

First—Simplicity. In this outfit all the machinery is the engine and compressor, the engine stationary and where it can be used for other purposes. The compressor is simple and has no leather to wear out, the plunger being fitted with steel rings, the same as the piston head in a steam engine.

Second—Lightness and convenience of load. The outfit makes a comparatively light load, the air tanks weighing only about 175 pounds when charged. One need not necessarily use the Niagara sprayer; any tank able to stand the pressure would answer, but the Niagara is as good as can be made and is a very convenient shape, is safe and with the air tanks makes a convenient load. In this valley much of our spraying must be done in the winter when the ground is more or less wet, and on the hill land it is especially necessary to make the load as light as possible.

Third—Being able to protect the machinery from the corrosive effects of the spray. There is absolutely no machinery exposed to the action of the spray and, by keeping the tanks painted, it will last indefinitely. Everyone knows the destructive effects of different winter sprays on machinery.

Fourth—Effectiveness. Your compressed air is always ready, you can use one or more hose. All that is necessary is to turn on a little more air. I use two hose with two nozzles on each.

I used the outfit first to spray my apple orchard with Bordeaux; then I had some trees infected with scale, so I used some of the Niagara spray, simply pouring the necessary amount of the solution into the sprayer and adding the water to make it the proper strength.

It is not necessary to agitate, the last drop being just the same as the first; no sediment whatever.

In constructing a spray outfit, two conditions must necessarily be met. Either the spray tank must be heavy and strong enough to stand the necessary pressure, or in using a lighter tank it is necessary to haul with you the machinery necessary to furnish the pressure as you go and, as I said before, it is easier to compress the air at home and use the Niagara sprayer.

The first cost of this outfit is somewhat greater than of some others, but not more than the large power outfits, and as a large amount of work can be done with it the outlay is a good investment, the expense of running it being so small.



In selecting trees for a new orchard the main part should be of well-tested and approved varieties. This is true of any kind of fruit. Look around, if possible, and see what kinds do best in your immediate vicinity. A tree or plant that does well in one locality may not give satisfaction at all in another, because of differences in soil and other surroundings. It is all right to try a few

new varieties and do a little experimenting on your own hook, but don't get too many of them. Young, thrifty trees should be selected instead of large ones, for the reason that young trees can be dug with better roots and are less apt to be damaged in handling. Experienced planters have found that quicker progress can be made with young trees than



S. A. HERRING.

Northwestern agent of the Pacific Fruit Express Company. Mr. Herring came to the Northwest in May, 1897, as agent of the Armour refrigerator car lines, and in his official capacity has been closely identified with the shipping of many thousands of cars of apples, strawberries and other perishable fruits. The first year he took hold of the business the Armour Company shipped 500 cars. Last year 6500 cars were shipped under his management, and this year this big output is expected to be increased. Last October Mr. Herring retired from the service of the Armour Company to become agent of the Pacific Fruit Express Company. His territory includes Oregon, Washington, Idaho and Utah, in all of which sections he is well and favorably known for his enterprise and business integrity.

with big ones, and a beginner cannot do better, usually, than to follow in the path of those who have demonstrated their knowledge by practical experience.



BEN CAMPBELL.

One of Oregon's pioneer railroad officials who did much to help develop the state. Mr. Campbell was for a long time connected with the Oregon Railroad and Navigation Company as its general freight agent, afterwards with the Great Northern in a still higher capacity, and later with one of the big Eastern railroads. He is well known in the Northwest and deservedly popular.



## DOINGS OF FRUIT GROWERS OF THE NORTHWEST

**T**HE VICTORIA, British Columbia, Fruit Growers' Association recently affiliated with the British Columbia Central Exchange, an organization that is the result of the great growth of the fruit growing industry in British Columbia. Other local asso-



JUDGE FREMONT WOOD,

Of Boise, a prominent Idaho orchardist and president of the Idaho State Fruit Growers' Association.

ciations that are affiliated with the larger association are those at Nelson, Chilliwick and Vernon. The headquarters of the association are at Revelstoke, and the manager is James Drummond.

Hamilton, Montana, the center of the Bitter Root Valley fruit growing area,

is making extra efforts to have all fruit men there take an added interest this year in the products of that district. It has adopted the slogan of "Better Fruit in the Bitter Root" and has held several meetings to secure these results. By forming an association there last year it had the most successful season in its history, and this year proposes to do even better. The Mackintosh Red and Transcendant crab apple are among the best products of the Bitter Root Valley. The latter is said to be one of the most profitable fruits marketed and returns from it there are such as to astonish the uninitiated. The fine irrigation system in this valley is fast turning it into one of the finest orchard districts in the Northwest.

The Yakima Valley country rejoices in the fact that the Northern Pacific Railway will put in operation five hundred new refrigerator cars for the transportation of fruit this year. Car shortage has hampered growers in that district considerably during the past two years, and this will undoubtedly relieve the situation.

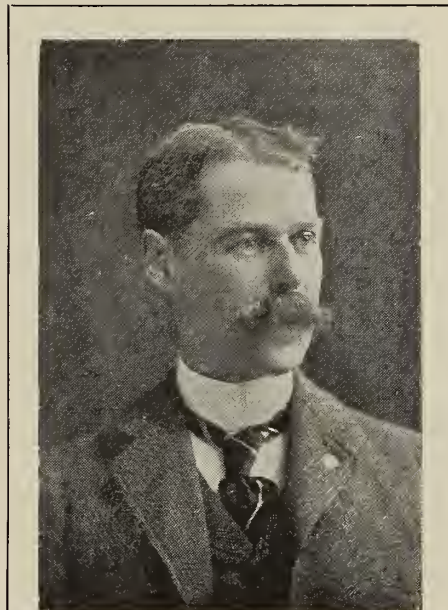
Kennewick, Washington, White Salmon and Hood River, Oregon, are preparing for their strawberry crops. Berries are expected to be a little earlier than usual this year. It is thought that shipping will commence somewhere between the 10th and 15th of May.

Hood River apples in South Africa is the latest. Not that savages have taken to eating them, for they are a little too high priced for the dusky inhabitants of that quarter of the globe, after traveling across the American continent, over the Atlantic to London, and from there to Africa. News that the Hood River apple was known and its flavor and fine qualities enjoyed there was recently received by P. J. Jonas of Portland, who has a brother acting in the capacity of missionary in the Orange Free State. He writes that notwithstanding its long journey the fruit was received in fine condition.

Meyers and Kettle Falls, Washington, and the adjoining small towns near there are branching out into the fruit business more strongly than ever. More acreage has been set to trees, irrigation projects are under way and box factories are being erected to facilitate shipping. The good profits received for their apples in these districts last year have resulted in stimulating growers there to raise more fruit and put it up more attractively.

Bitter Root Fruit Growers' Association at Hamilton, Montana, after hearing the results of the first year's work as an association as shown by the reports of President J. O. Read, and Manager H. Ferbrache, as read at the annual meeting of stockholders on April 8, clearly demonstrated that such organizations pay. For notwithstanding the

shortage of cars to move the fruit at a time it should have gone to market, the absence of buildings or proper facilities for shipping, and the financial depression, cutting down values fully one-third of what they would have been, a comparative table of average prices received



A. P. BATEHAM,

One of the Mosier Valley, Oregon, enterprising fruit growers and president of its Commercial Club

in the past three years, plainly shows that this year's prices excelled all others fully thirty cents per box. While as a financial proposition to the stockholder it is very satisfactory, the earnings over expenses of management would, if so used, make a dividend of over 125 per cent on actual working capital. At this meeting instructions and authority was given the directors to build or arrange for suitable buildings to handle the com-



TOM RICHARDSON,

Manager of the Portland, Oregon, Commercial Club

There is probably no better known or more highly esteemed figure in Oregon's commercial circles than Mr. Richardson. Going to Portland several years ago he took the management of its commercial club and under his guidance it has grown to be a most potent factor in the upbuilding of that city and the state as well. Mr. Richardson is the friend of the fruit grower, and believes that a great future is before that industry in the Northwest.



E. E. ELLIOTT,

Professor of agriculture and superintendent of the Farmers' Institute, State College of Washington, at Pullman.



ing season's crop. From present indications the production will far surpass any other year, and it is the intention of the association to grade up more closely than ever before, so that the Bitter Root apple may be more acceptable to the consumers of fancy fruit.

Grants Pass, Oregon, is preparing for war on the codling moth this year on a scale never before attempted there. This pest had secured a firm foothold there, but with the good work done last year and that which will be done this year that section expects to stamp out this great enemy of the successful fruit grower.

Coeur d'Alene, Idaho, will soon fall into line with an organization. Several meetings have been held for this purpose and prominent fruit men from various parts of the state have addressed the meetings. When perfected the organization will be known as the Kootenai County Fruit Growers' Association.

Marion County fruit growers recently met at Salem, Oregon, and organized a company with a capital stock of \$50,000, \$4000 of which was paid in. The company is being formed for the purpose of protecting the interests of the fruit growers of the county and upholding the markets for its fruit products.

Pullman, Washington, State College announces that it will soon place several new varieties of apples at the disposal of growers in that state. Professor W. Thornber has been in charge of the work and will send two of each of the varieties to be planted by growers in various parts of the state.

Willamette Valley farmers have come to recognize that there is more money in the fruit business than in general farming, and many of them are cutting up their farms to be sold and planted to small acreage in fruit. This is particularly so where canneries are being established.

Colfax, Washington, reports that prospects for a good fruit crop in that neighborhood are bright, and that the Snake River district has this year been untouched by frost. The cherry crop is expected to be a particularly good one, and other fruits are said to have wintered well.

Milton, Oregon, will soon have a large new warehouse, which will be erected by the association there. It will be constructed of concrete, be two stories high and with a basement and elevators. Money to erect it was secured by increasing the capital stock of the association.

Corvallis, Oregon, is to erect a cannery that will have a capacity of 50,000 cans per day. This large output is not expected at once, but to gradually grow until it reaches that figure in five years. Vegetables as well as fruit will be taken care of by this mammoth plant.

Klamath Falls, Oregon, is one of the latest additions to the fruit growing districts in the state. A firm has just been formed there for the purpose of going into the nursery business and will raise stock to be planted in that district.

Medford, Oregon, fruit growers are busy improving that district and setting more trees. Orchard land there is gradually rising in value, and a twenty-acre orchard recently sold for something over \$16,000, or a little better than \$825 per acre. In this connection it is inter-

esting to note some of the prices recently received for fruit land in the various sections of the Northwest. At Ashland a 130-acre orchard sold for \$52,000; 240 acres near Walla Walla, Washington, suitable for fruit, brought \$18,000; 400 acres of undeveloped land in the Spokane Valley sold for \$40,000; at Hood River 31 acres were sold for \$31,000, or \$1000 per acre, and a sale is reported from Wenatchee of 39 acres for \$50,000.

Dufur, Oregon, long the home of the grain grower, is firmly of the opinion that there is more money in fruit than

in grain. Mr. Harris, county fruit inspector of Hillsboro, Oregon, has issued the following notice to recalcitrant fruit growers there: "As soon as blossoms fall you will start in at Beaverton and either spray or cut down every fruit tree one-half mile on each side of the railroad track that is not sprayed. Be sure that every man has received a notice before you cut or spray his trees." Mr. Harris evidently means what he says.

Waterville, Washington, has interested capitalists who will plant 150 acres there soon.

The Dalles, which is the second oldest town in Oregon, claims the distinction



THE FIRST FRUIT TRAIN

The train was run on the Spokane and Inland Electric Railway through many of the fruit growing districts in Washington and Idaho for the purpose of instructing fruit growers and attracted wide attention. The above illustration shows the crowd around it at Greenacres in the Spokane Valley.

in that cereal. So much demand has been created for fruit land there that ninety acres of orchard set by the Dufur Orchard Land Company has been sold to be cut up into small tracts and many others have been set out. Dufur has exhibited some very fine fruit at the Wasco County fairs for several years, but it is only recently that it has been recognized as a fruit country.

Wenatchee, Washington's setting of trees was larger this spring than ever before. One tract alone comprising 140 acres was planted to trees of the Wine-sap variety. This apple has been uniformly successful in the Wenatchee country. In addition to these two tracts, one across the Columbia River near there of 150 acres, and another of 210 acres, was planted, making, it is said, the largest commercial orchard in the state.

Spokane's big apple show will be patronized by L. W. Hill, president of the Great Northern Railroad. That gentleman has been selected as head of the board of directors, and has signified his willingness to serve in that capacity. In addition to the other officers an advisory board of sixteen members was selected from the various fruit growing districts in the state.

The Weiser Fruit and Produce Association of Idaho held its second meeting a few days ago at Weiser, and agreed to issue 10,000 shares at \$5 a share, making a capital of \$50,000. This looks like business.

Myrtle Creek, Oregon, has reported considerable planting of strawberry fields. Nice berries are grown at this place. They mature early and command a high price in the Portland markets.

W. R. Harris, county fruit inspector of Hillsboro, Oregon, has issued the fol-

lowing notice to recalcitrant fruit growers there: "As soon as blossoms fall you will start in at Beaverton and either spray or cut down every fruit tree one-half mile on each side of the railroad track that is not sprayed. Be sure that every man has received a notice before you cut or spray his trees." Mr. Harris evidently means what he says.

Lewiston, Idaho, can evidently grow as fine peaches as can be raised anywhere if the word of big wholesalers goes for anything. Recently one of them selected peaches from that district in preference to those grown in California to supply his trade.

Medford, Oregon, has, according to Fruit Inspector Taylor of that county, 35,000 acres of orchard planted, and 8000 acres in bearing. The number of trees and acreage is as follows:

Apples		
Variety—	No. Trees.	Acreage.
Newtown .....	5230	87
Spitzenberg .....	1125	20
Jonathan .....	2493	42
Ben Davis .....	396	11
Pears		
Comice .....	1400	20
Bartlett .....	5420	78
De Anjou .....	1627	23½
Howell .....	1786	25
Clargeau .....	540	8
Winter Nellis .....	1396	20
Bosc .....	1620	22½
Mixed .....	100	2

J. C. Pearson Co., San Francisco, California—Dear Sirs: Replying to your favor of the 26th, we beg to say that the different associations composing this Exchange have for a number of years past used the Pearson cement coated wire nail in making up all of their orange and lemon boxes. Our output has averaged over a thousand carloads of fruit annually for several years back. We have found the Pearson nail uniformly satisfactory, and our experience has convinced us that there is no nail on the market better than the Pearson nail for box purposes. We have at different times experimented with other nails, said to be "just as good," and have found them distinctly inferior to the Pearson nails. Yours respectfully, A. C. G. FRUIT EXCHANGE, per P. C. Daniels, Secretary.



# THE FIRST FRUIT TRAIN A PHENOMENAL SUCCESS

A MILE-STONE in the history of fruit-growing has been passed. On March 26, 27 and 28 the Spokane and Inland Electric Railroad inaugurated the first fruit train that has been run. There have been demonstration trains of various sorts run over other railroads, holding short sessions among the farmers themselves, but these trains have had for their purpose methods in general farming. Such have been the Nebraska and Iowa corn and wheat trains. The Palouse region of

Lectures and practical talks showing how to do things, were given at nineteen stops, and over two thousand farmers and fruit growers availed themselves of the opportunity to broaden their views. The special train consisted of the private car of President Graves, and a parlor observation car as a trailer. From the rear platform the lectures were given at most places, and this part of the train was fitted with a blackboard, with displays of injurious insect pests, and with photographs of run-down

questions, the crowd called out a hearty request to come again.

This train was a venture. It invaded a region practically given over to wheat. But its success was a revelation to all. The audiences were pleased, they had practical things shown to them. There was no theory in the talks. In ten minutes they were told exactly what to do and how to do it. They did not need to be told why or wherefore. They already knew to the tune of wormy apples, ignorantly slashed orchards, or uncultivated, weedy ground. The lecturers were pleased. It is rarely that practical demonstrations can be carried out at an institute and with the short crisp speeches that appealed better than a long dissertation, and with an audience already assembled at each place, with no lagging, but everything ready to the minute, it is small wonder that the speakers felt this to be the best institute series they had attended. That the railroad officials were pleased is apparent from their promise to continue special demonstration trains in the near future, and while theirs is the selfish hope of increased traffic by better farming, let us hope that the ideas sown by the fruit train will result in better fruit and more fruit, even beyond the expectations of a railroad man.

Professor Melander confined his talk generally to the codling moth, and it is surprising how much information could be given in a ten-minute demonstration with charts and spray pump. This insect is by far the most serious apple pest in the Palouse region. Yet Professor Melander has abundantly shown that with systematic care practically 100 per cent of clean fruit can be regularly counted on. The maxims of codling moth work are few and easily understood. Nearly all of the worms of the early summer enter apples at the calyx end. This portion of the apple can be coated with poison only within the week following blossoming, and then only by shooting a coarse spray under high pressure directly into every blossom. Apples thus treated will not become wormy. There will also be no late brood of worms, for the early worms must live in order to beget the later ones.

These principles can be carried out in practice only by a perfect spraying after blossoming time. The lower calyx cup of every apple must be filled and this requires the closest attention. The spray pump must be kept constantly above eighty pounds pressure. Bordeaux nozzles are essential, and they should be set at an angle to the extension rod so that most of the spray can be thrown down directly into the flower, and arsenate of lead must be used. One pound of arsenate of lead is sufficient for fifty gallons of spray.

While it is best to concentrate one's attention on a thorough first spraying, many a grower will not take the trouble, and for him several later sprayings are necessary. Later sprayings are unsatisfactory. It is difficult to time them properly, and at best they afford but little relief.

By means of a Bean Magic, a hand spray pump that can be maintained at 200 pounds pressure, the fruit growers were shown the difference between pressure spraying with Bordeaux nozzles set at an angle, and the usual misty type that has prevalent use. A few seconds demonstration sufficed to convince the



THE FRUIT SPECIAL READY TO START ON ITS JOURNEY

In the group are horticulturists, prominent railroad men and employes who accompanied the train on its tour of instruction

Eastern Washington and Western Idaho is now given to general farming. Here and there are special farms, principally devoted to winter apples. These farms are eminently successful and have demonstrated that the Palouse Country is vastly more important for the production of fruit than to remain as the over-sized general farms now prevalent.

That the general farmer needed instruction in growing and handling the fruit side of his farm was the thought that led the Spokane and Inland Electric Railroad to arrange for a special fruit train. Professor W. S. Thornber, horticulturist of the Washington State Experiment Station, Professor A. L. Melander, the entomologist, and Professor R. K. Beattie, the botanist, of the same place, all of them men who have attained recognition among fruit-growers, were asked to accompany the train as instructors. Additional instructors from outside the State College were secured, and C. L. Smith, who used to be "Minnesota Smith," but who now hails from Spokane, and who has had over twenty years of continuous experience as a lecturer at farmers' institutes, as well as John S. Hughes, an expert in the construction and management of fruit canneries, assisted at all the longer stops. For three days this train was in closest touch with Palouse farmers.

orchards that have been taken over in treatment by the Experiment Station men and reclaimed.

An important feature of the demonstrations was a large orchard spray pump of the high pressure type necessary for spraying for codling moth. This was equipped with the recent inventions brought out to simplify spraying, and enable the farmer himself to handle the different types of nozzles at pressures ranging from thirty pounds to 250 pounds. Nothing could convince the grower more readily of the need of modern methods in the treatment of orchards than to have explained to him in this practical manner the differences between antiquated and up-to-date spraying.

Necessarily the stops were brief, but as the train pulled in, in each case prompt to the minute, there was an audience assembled eager to learn. In many cases these men had come from five, ten, or even, as two men did, from forty miles in the country, for the problem of fruit-raising is a vital one with them. Then the dash and novelty of a demonstration train attracted many who would shun a prosaic institute. In each case the audience was eager for more, and when the train pulled out with the last speaker still talking or answering



farmer better than pages of description, and the fruit train left him resolved that this year he would get the better of the codling worm.

Apple scab was the topic treated by Professor Beattie, as that is the most serious disease of the Palouse orchard. The customary treatment for this fungous is to give two sprayings with Bordeaux mixture, first at the pink of the blossom and second just after the petals fall. It seems that the second spraying is frequently responsible for a scorching of the fruit, which may amount to more than the saving from scab. Accordingly the Professor advises

he, "not higher than eighteen inches, for it costs money to grow tall trees. Tall trees cannot be properly sprayed, the fruit is hard to pick, and they lose many windfalls." In the Palouse district there is sufficient rainfall for orcharding if the moisture is only conserved. The orchard is but a big reservoir, which is emptied during the summer. A dust mulch is the best lid to put on this reservoir to prevent evaporation.

At the longer stops C. L. Smith spoke on the handling of the commercial orchard. His advice was to concentrate on standard varieties of apples that the market demands, and suggested to the

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but the first spraying, as that is by far the most important, and where the second spraying is necessary it must be applied lightly, using the Vermorel type of nozzle. With the spray pump at hand and the leads of hose fitted with the different kinds of nozzles, the farmers could easily grasp the distinctions between the codling moth spraying and spraying for apple scab.

By a dexterous use of the blackboard Professor Thornber showed the essentials of pruning from the time the trees are set out. "Head your trees low," said

Palouse farmer the Rome Beauty, Wagner and Jonathan. "Be honest in your pack," said he. "A reputation for honesty is worth more than the fruit itself."

John S. Hughes, who acted as manager and chairman of the trip, condensed his advice to "ship the best and can the rest," but by this time every farmer felt that with all the suggestions he had received "there wasn't going to be any rest."

◆ ◆ ◆

One of the largest settings of grapes that has been made this year has been put out by W. B. Sherman near Grants Pass, Oregon. The grapes are of the Flame Tokay variety, and in all 180 acres were planted. The whole tract comprises 300 acres.

◆ ◆ ◆

According to Professor Thornber, of the Washington State College, the acreage already planted to fruit in that state when in bearing will yield from \$40,000,000 to \$60,000,000.

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## ELIMINATION OF FIRST SPRAYING FOR MOTH

BY L. D. HARRIS, MEDFORD, OREGON

SINCE presenting my paper on spraying for the codling moth at a meeting of the State Horticultural Society, held at Medford in August, 1907, and from the attention which has been attracted by its publication in "Better Fruit," I find that my conclusions and ideas are a decided departure from the accepted ideas as to the best methods of fighting the moth, and more particularly from any of the theories advanced in their bulletins or otherwise by the entomologists at the experimental stations throughout the country, as these

suffice to kill all the worms that seek to enter the apple, either by way of the calyx end or otherwise.

In addition to this, spraying at this early date necessitates further sprayings, as it cannot be denied that this one spraying alone would leave the skin of the fruit entirely unprotected at the time the worms are hatching. Professor Melander, in attempting to criticize my conclusions, states "we know that three-fourths of the first brood of worms attempt to enter the apple by way of the calyx cup. \* \* \* Obviously we



ONE OF THE VARIETIES OF THE SUB-SOIL PACKER. THIS TOOL IS THE BASIS OF THE SUCCESS OF THE CAMPBELL SYSTEM

government and state paid experts unite in telling us that they are unable to grow clean apples or kill the worms by spraying without filling the calyx cups with insecticide immediately after the petals fall, while I have demonstrated in actual practice that it is not only possible, but feasible.

This evidence is proof positive to me, as well as to many other apple growers in the West, and particularly in Oregon, that these professors should take a short course in spraying (say anywhere from five to ten years before taking the responsibility of advising the apple growers as to the best methods of eradicating the codling moth.

In this connection I refer particularly to the article published in the January edition of "Better Fruit," advanced by Professor Melander of the Experimental Station of Pullman, Washington. Professor Melander's contention is that one spraying with arsenate of lead solution, one pound to fifty gallons of water, will destroy the first brood of worms so completely that there will not be enough of the second brood develop to pay for later spraying. I have read a great many very unpromising articles on spraying, but believe this to be the worst of all, considering that it comes from one who claims to be a professional entomologist, and is in charge of the experimental work along these lines for the State of Washington.

Spraying the calyx cup as soon as the petals fall is to be recommended to the novice, and to any grower who has not the facilities and experience necessary to enable him to thoroughly spray the young fruit after the calyx is closed. The one point that I take such exception to is the weak solution of one pound of arsenate of lead to fifty gallons of water. In all my experiments with arsenate of lead I find that less than two and one-half pounds of arsenate of lead to fifty gallons of water will not

cannot ignore seventy-five per cent of the worms." How "we know" this he does not state, but even granting his "knowledge" to be correct, he is plainly "ignoring" the remaining twenty-five per cent, which would certainly not be destroyed by the insecticide in the calyx cup. On the other hand, as I pointed out minutely in my former article, the "seventy-five per cent" which so menaces the welfare of the apple, according to the professor, are certainly not ignored if the fruit, calyx end, skin and all, are thoroughly coated with poison before the brood hatches. This fact has been successfully demonstrated by the writer upon a large scale, in actual practice, and the most that the professor has to say to refute it is that, speaking of the writer's success with his method, "strange as it may seem, he filled the calyx cups with poison." In this connection it is also worthy of note that the professor ascribes the writer's success to the fact that he "unknowingly placed" his spray at the effective point; the writer did not "unknowingly" place his spray at all, but knowingly placed his insecticide where it would do the most good, and is surprised to learn that this is not the method in use at Pullman, Washington.

In conclusion, the writer wishes once more to emphasize the fact that his method of eliminating the first spraying for codling moth is one for the consideration of every careful horticulturist, as it secures the desired result with a minimum expenditure of time, labor and money. It is not necessary at this time to reiterate my conclusions and the results of my investigations in detail, as they were all given at length in the November issue of "Better Fruit," and in his criticism Professor Melander has not disputed any of them except by broad, general statements of what "we know."



## VALUE OF FIRST SPRAYING FOR CODLING MOTH

BY PROFESSOR A. L. MELANDER, PULLMAN, WASHINGTON

**T**HERE are often several ways of accomplishing a purpose. Many of us seem to think there can be but one way. In the growing of apples one man has a pet idea for keeping them free from the codling moth; another grower is equally successful, but his method is different. In this instance the purpose the fruit growers had in view was to coat the fruit with poison before the worms entered. The details of application were different. Mr. A. says: "I succeeded with my method. It is the only way." Mr. B. says: "Don't follow Mr. A. I know mine is the only sure way, for I was successful."

While Messrs. A. and B. and C. and D. are wrangling over the merits of their individual methods, it rarely occurs to them to make a comparative test of all together in one orchard, where the conditions would be uniform. Sometimes they do make the test, but then they go to Mr. A.'s place to try out the methods. Now Mr. A. is a progressive farmer—if he wasn't he would not be so enthusiastic over his successful method—and Mr. A.'s orchard is clean to start with, and there isn't any telling after the tests which method is really the best, for all turn out to be good. It is for this reason that experiment stations are looked to to settle the dispute, and it is for this reason that comparative tests should be conducted in wormy orchards, where any difference in the value of the various methods will be sure to show up.

The reason that I am rambling on with this tale is that as a professional entomologist I am constantly called on to reply to the different people who pronounce new and successful methods for fighting the codling moth. It would keep me pretty busy if I were to try to answer all the unpromising ideas we hear of, and so I do not reply to any. In the present case, however, I have had so many requests about an article by Mr. L. D. Harris, published in the November issue of "Better Fruit," that I give in and write this.

First of all I shall say that Mr. Harris' article but emphasizes the same conclusions I advanced in an article in the January number of this journal. This statement may sound strange to my correspondents who have been wishing me to write. They have noticed only the discrepancies in the details and have magnified a few points into a whole paper.

Mr. Harris takes this stand: Only part of the first brood of worms enter at the calyx, because the eggs are not laid there, and these worms do not enter until some weeks after blossoming. It is more important, therefore, to coat the surface of the fruit than the bottom of the calyx cup. Spray just before the hatching of the first eggs, and reinforce with a second spraying just before the maximum hatching, three weeks later. Spray with three pounds of arsenate of lead to each fifty gallons of water.

The essential point wherein I differ is, "that most of the first brood of worms enter at the calyx end." It is, therefore, more important to coat the bottom of the calyx cup than the outside of the apple. This inside coating can best be applied just after the petals fall. Arsenate of lead is just as effective one-third as strong as Mr. Harris uses.

We both agree here, and mark these points well: Spraying for the first brood

of worms can be so thoroughly done as to protect the fruit crop. When there are no progenitors left for a second brood there is no necessity for late sprayings. To do such spraying requires carefulness and patience. Every apple must be dosed. To do such spraying requires a driving spray under high pressure and delivered through Bordeaux nozzles.

The two points that I take exception to are the belittling of the value of the first spraying and the mistaken idea as



PRUNE TREE IN PAYETTE VALLEY, IDAHO  
Prunes are a profitable crop in this district, which ships many carloads during the season.

to where the worms enter. We know that three-fourths of the first brood worms attempt to enter the apple by way of the calyx cup. The location of the egg has nothing to do with where the worm will enter. The eggs may be on the leaf or on the apple, but the worm seeks the calyx cavity. Obviously we can not ignore seventy-five per cent of the worms.

Every once in so often we hear of the man who comes forth with the question: "If no worms are hatching until a month after blossoming time, why should we waste our material on an early spraying?" The answer is simply that we can not afford to ignore seventy-five per cent of the worms that we know will enter the calyx end if we don't fill it with poison at the early spraying. We could fill it later, but it would be difficult to do it thoroughly, and under very wormy conditions would not be practical. To show this I cite some facts which give a pointed answer to the question. In these cases the second spraying corresponds to Mr. Harris' first, and all the sprayings were given as a driving spray through Bordeaux nozzles.

In an abandoned orchard at Walla Walla that I sprayed this season, those trees that were not given the first spray-

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ing, but which received three subsequent  
sprayings, produced fifty-two per cent of  
worm-free fruit. Trees not sprayed at  
all had also fifty-two per cent clean, but  
where the first as well as the other three  
sprayings were all given the crop ran  
ninety-eight per cent clean. If this evi-  
dence is to be believed it tells us that the  
first spraying must be given on time so  
as to reach the inside of each flower.  
It tells us, moreover, that the first spray-  
ing is everything. If not given, there is  
little protection in the subsequent spray-  
ings, no matter how many of them are  
given.

This past season the United States  
Bureau of Entomology has conducted  
extensive sprayings for the codling moth  
in Arkansas. Those orchards that were  
selected too late for the first spraying  
raised only thirteen per cent better than  
the unsprayed orchards, although four  
careful applications of spray were given  
later.

In our own experiments at Spokane  
last year a block of trees was not given  
the first spraying, but was treated like  
the remainder of the orchards the rest of  
the season. These trees lost fifteen per  
cent of their crop, while the remainder of  
the orchard lost but two per cent.

In our experiments of 1905 at North  
Yakima those trees that received the  
three later sprayings only were thirty  
per cent cleaner than the unsprayed  
check trees, but were also twenty-four  
per cent wormier than when the first  
application was also given.

Recitals like these could be given ad  
lib., but these cases show plainly enough  
that the first spraying, just after the  
blossoms have fallen, is the most valu-  
able application that can be given.

Now the question arises: Why did  
Mr. Harris get such good results when  
he omitted this spraying? There are two  
reasons. His orchard was not run down

to start with, and, strange as it may  
seem, he filled the calyx cups with poi-  
son. His spraying was done one month  
after the usual time, corresponding to  
our second spraying, and at that time the  
apple calyx is not so completely closed  
over but that the coarse spray from Bor-  
deaux nozzles, driven under the high  
pressure of the engine pump, can pene-  
trate into the interior of the apple. We  
know it is easier to coat the innermost  
parts of the calyx cup a month after the  
blossoming period than at the time of  
the first spraying, if only we can get the  
spray past the folded sepals. This is due  
to the fact that when the petals are  
falling the lower calyx cup is hidden  
underneath a compact cap formed by the  
fleshy stamen bars. After a month these  
bars are shriveled, and then it is easy to  
penetrate them with a spray. But by  
this time the sepals have folded over so  
as to hide the calyx cavity, and it is only  
a driving spray that can enter the calyx  
cup now.

The only reason we advise spraying  
just after the blossoming period, instead  
of waiting until the worms appear, is  
because that is the easiest and surest  
time to coat the calyx cup with poison.  
The instances cited above will bear wit-  
ness to that. Mr. Harris sprayed care-  
fully, and undoubtedly forced some spray  
into the blossom end. If he will section  
some of his sprayed apples I feel sure he  
will find arsenate of lead in the bottom  
of the calyx cavity. His success was not  
due so much to the uniform coating on  
the outside of the apples as to the spray  
that he unknowingly placed at the effec-  
tive point.

◆ ◆ ◆

Commissioner of Horticulture F. A.  
Huntley comes forward with the state-  
ment that the value of orchards in the  
State of Washington is no less than  
\$93,821,600.

## A TREATISE ON FERTILIZING THE GRAPEVINE

FROM OREGON AGRICULTURALIST

IN A preliminary report published in  
"Revue Viticole" regarding some ex-  
periments in the fertilization of grape  
vines, there are some interesting facts  
which are at least suggestive to the  
Pacific Coast grape grower. The report  
covers three years of experimental work,  
and Professor Verdie, who had the  
experiment in charge, finally draws the  
conclusion that he favors a combined  
fertilizer for vineyards located on a  
sandy, non-calcareous soil, consisting of  
one part dried blood, two parts sulphate  
of potash, eight parts basic slag and four  
parts gypsum. He reaches the interest-  
ing conclusion that growers are war-  
ranted in using chemical fertilizers in the  
manuring of vines for the production of  
high grade wines. Although nitrogen  
increased the vigor of the vines where  
the amount used was large, the quality  
of the must appeared to be less rich than  
in plants where the nitrogen content was  
small. The writer states his belief that  
potash has a decided influence on the  
quality of the fruit and must, and recom-  
mends the use of the complete fertilizer  
indicated above, including the gypsum.  
We may suggest, as an experiment, the  
application of 100 pounds of dried blood,  
200 pounds sulphate of potash, 800  
pounds Thomas phosphate and 400  
pounds of gypsum to the acre.

The grape is a crop which is likely to  
show good results from the use of pot-  
ash. It is a gross feeder on this side of  
plant food. As compared with citrus

fruits, it removes at least a fourth more  
potash, a half more phosphoric acid and  
only about half as much nitrogen. While  
the nitrogen may be added to the vine-  
yard by the use of leguminous crops to  
be turned under, it is possible to add the  
mineral fertilizers, potash and phos-  
phoric acid, in no other way than by  
direct application.

As to whether it is or is not best to  
use commercial fertilizers, it may be said  
that this cannot always be determined  
from a soil analysis. The question may  
be reduced to a practical commercial  
one, viz: Can we produce enough impor-  
tant products to pay for the added cost  
of the plant food and labor, leaving a  
surplus for profit? If we can determine  
this to be the case by experiment, then  
it matters not what may be the soil com-  
position; it will pay to use the fertilizer  
to form a growth and crop within the  
limit of safety and of health of the plant.

As to the use of nitrogenous matter  
for the grape, it may be said that stable  
manure is not generally looked upon  
with favor, as it is said to induce fungus  
attacks by weakening the vitality of the  
plant. Much better results can be had  
by the growing of legumes and crops  
between the rows and encouraging the  
larger growth of such crops by the addi-  
tions of potash and phosphoric acid. By  
such a system the vineyardist not only  
adds to the store of plant food in his  
soil, but at the same time vastly improves  
its physical condition. George Wright.



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at the postoffice at Hood River, Oregon,  
under act of Congress of March 3, 1879

WE WERE recently told by a gentleman who holds one of the most prominent positions in the Northwest as the representative of one of its foremost commercial bodies that "Better Fruit" is the finest fruit paper printed in the English language. We are also in receipt of many letters telling us that they can't grow fruit without "Better Fruit" and from others who tell us how much it is doing to help develop their districts. We are glad to know these things, as it is the aim of our paper to be of the greatest possible help to the fruit grower individually, and to fruit growing communities at large.

While our subscription list and advertising patronage are rapidly increasing, there are many districts in the Northwest in which we are not receiving the support we are entitled to. A glance over any of the copies of our publication will show its inestimable value in calling the attention of capital to the advantages and opportunities awaiting the investor in fruit land, as well as instructing him how to grow perfect fruit and get the highest price for it. We have spent and are still spending a large amount each month with these ends in view. For this reason we believe we are entitled to the support of growers and others interested in the fruit business, and more especially advertisers. If you are not a subscriber to "Better Fruit," write us for a sample copy which we will cheerfully furnish. If you are an advertiser and want to secure a medium that will get you results, write us for our rates and also a copy of our paper.

◆ ◆ ◆

THE RECENT announcement by the Northern Pacific officials that 500 additional refrigerator cars would be placed at the disposal of fruit shippers this season indicates that the railroads are recognizing the needs of the grower, and are endeavoring to better shipping facilities as fast as possible. Recent statements show that other railroads and private car lines will endeavor to give shippers more cars this year. In view of the big increase in the fruit output expected this will be welcome news to both buyer and shipper, and should result in a much more satisfactory delivery than was possible last year.

◆ ◆ ◆

IT IS evident from the great interest being taken in spraying experiments for the codling moth that growers are no longer entirely leaving methods for

its eradication to entomologists. Practical experiments under natural conditions are being made in several districts with the end in view of reducing the number of sprayings. If it can be thoroughly demonstrated that one or even two sprayings will accomplish the work of three or four a long step will be made toward lessening the work of the grower and also a very considerable decrease in his expense. Articles that have appeared in "Better Fruit" from Professor Melander of the State College at Pullman, and Mr. L. D. Harris, in charge of a large orchard at Medford, Oregon, show that much has been accomplished along this line, and the end of the present fruit growing season will probably put the grower in possession of much valuable information in this respect.

◆ ◆ ◆

THE NEW postal laws recently put into effect make it necessary that all subscriptions be paid in advance. For this reason we have been sending

delinquent subscribers notices to that effect. We think that the subscribers to our paper want it and that many of them have not paid simply because they have neglected to do so. We regret, however, that the law leaves us no alternative, and that unless subscriptions are paid up promptly we will be compelled to drop them from our list. Prompt payment, therefore, on the receipt of an expiration notice will guarantee the receipt of your copy of "Better Fruit" for another year.

◆ ◆ ◆

NOT IN several years has there been such promise of a bumper crop of all kinds of fruits. From every district in the Northwest that we have heard from reports are to the effect that apple, cherry and pear trees are loaded with blossoms, and that injury from frost has been so slight as to have practically done no damage. Strawberries and other small fruits are also reported to give every evidence of bearing heavily.

## ANOTHER VIEW OF MOTH AND SCALE SPRAYING

Continued from page 11.

enough warm water (it is possible to use cold, though not so good) to make 250 gallons of spray. Do not forget when the water is taken out of the salt barrels to refill each of them. If you wish to use your spray immediately, five pounds of lime may be added every ten minutes until all is used. The solution should be stirred while spraying.

With my outfit I spray out 2000 gallons a day and do the cooking of the lime and sulphur at mornings, noons and evenings.

[Note.—Mr. B. F. Hurst, the writer of the above, is the author of a book entitled The Fruit Growers' Guide, and has lately completed a supplement containing the results of his latest experiments, which he will send with The Fruit Growers' Guide to any address for \$1.00. The Fruit Growers' Guide gives the life-habits of about fifty dif-

ferent insect pests, also life history of the tree. It also gives the best method of planting and cultivating, describing and illustrating budding and grafting, and picking and packing of the fruit.]

### What "Better Fruit" Did for One Firm

*Better Fruit Publishing Co., Hood River, Oregon:*

Enclosed find check to pay for December advertisement in your paper. We also hand you a copy of a letter from one of our patrons showing the result of our advertising in "Better Fruit."

"Yakima Valley Bank, O. A. Fechter, President; Charles Heath, Cashier. Capital stock \$75,000. North Yakima, Washington, December 16, 1907. Hanson-Rich Co., Kennewick, Washington — Gentlemen: We take pleasure in advising you that the sales of land made by you for us since the 21st day of October last aggregate more than \$25,000, and we beg to congratulate you upon the excellent showing, which not only speaks well for your enterprise and your methods, but for the flourishing conditions existing in the town of Kennewick as well. (Signed) Fechter & Rudkin."

Thanking you for the nice way you have handled our small ad., yours truly,

HANSON-RICH INVESTMENT COMPANY.



## CHERRY ORCHARDS CLOSE TO SPOKANE, WASHINGTON

Will be more profitable, according to experienced fruit men, than the famous orange groves of California. The choicest varieties of cherries, apples and pears, the three most profitable fruits grown in the Northwest, reach perfection in the irrigated orchards of the Spokane country. We are handling irrigated fruit land within six miles of the center of town, with every city convenience. Five and ten-acre tracts. Prices are low and terms exceptionally easy. We plant any variety of fruit trees and take care of them one year free of charge if desired. We handle irrigated land exclusively and only the best of that. Spokane is the biggest and most rapidly growing city in Eastern Washington and Idaho, and irrigated orchard land so close to the city will be immensely valuable.

Write us for full information.

KEELY & YOUNG, Inc. Club Building, SPOKANE, WASH.



## THE HOOD RIVER LAND EMPORIUM

### HOOD RIVER, OREGON

#### POSSESSES

**CLIMATE**—A desirable medium between the drier eastern and the more moist western conditions of the Northwest.

**SOIL**—Volcanic ash, rich in phosphates, and recognized as the best in the world for apples and strawberries.

Makes a specialty of real estate, conveying, loans and surveying. The president, John Leland Henderson, is a practicing lawyer residing in Hood River, and has been identified with the Hood River Valley for thirty years.

### Cutaway Orchard Disc Harrows

Extension, reversible; best tool ever used in orchard or fruit. One and two horses. Fruit growers' specialties. Catalogue. E. G. Mendenhall, Box 319, Kinmundy, Illinois.

## AGENTS WANTED

Can you sell goods? If so we need you. Complete outfit free; cash weekly. Write for choice of territory

### CAPITAL CITY NURSERY COMPANY

SALEM, OREGON

**W**OULD you like to have a home where the best peaches, apples, pears, prunes and cherries grow, where the climate is mild and healthful, where life is worth living?

WRITE TO S. J. HARRISON OF SUNNYSIDE, WASHINGTON, FOR THE INFORMATION DESIRED

### RANEY HOME CANNER

Save your surplus fruit and vegetables. Canning business at your own home. Time tried, OLD RELIABLE RANEY CANNER. Send for free book. E. G. Mendenhall, Box 319, Kinmundy, Illinois

### A Bargain in Fruit Land

Thirty-five acres seven miles from Grants Pass, Oregon; thirty acres of it level river bottom land cleared; fifteen acres under cultivation; some of it in trees; five acres upland suitable for grapes. One hundred inches of water for irrigation. Terms \$2500 cash September 1, 1908

Address Rev. W. C. Long, Grants Pass, Oregon

### To Practical Fruit Growers

If in any way bothered by that most important question of tree spraying, send for a copy of our valuable treatise on the subject

MORRILL & MORELY,

Spraying Experts, Benton Harbor, Mich.

## SOME POTENT FACTS ABOUT THE CODLING MOTH

BY A. L. MELANDER

**T**HE CODLING MOTH ruins a couple of millions of dollars of Washington apples every year. How much of this wormy fruit does your orchard produce? Have you a reputation for honest, clean, worm-free fruit? If you have, isn't it worth money to you? Isn't your reputation what fixes to a large extent the selling price of all the apples of your locality? If you have wormy apples, and a wormy reputation, read this—no orchard is so bad off but that it can be reclaimed by a single season's spraying. If you want to find out:

1. Why you should use arsenate of lead and nothing else.
2. Why you should not use misty Vermorel nozzles.
3. What pressure to use.
4. How much spray to put on a tree.
5. When it pays to get a power sprayer.
6. When you can spray in a rain.
7. How long a spraying is effective.

8. Whether your spraying is so poorly done that you should do it over again at once.

9. How to fit up an extension rod that is better than the one you are using.

10. What sprays should not be combined with codling moth spray.

11. How to tell when late sprayings are not necessary.

12. An easy way to time sprayings.

13. Whether to band the trees.

14. About codling moth traps.

15. What danger you have from your neighbor's moths.

16. Value of dust spray or gas sprayer.

If you want to find out about any of these points, or a hundred other suggestions on codling moth spraying, in short, if you want to raise 100 per cent of clean fruit with a single spraying, write to the director of the Washington Experiment Station, Pullman, for a copy of Popular Bulletin 5, entitled "Spraying for Codling Moth," by A. L. Melander. It is free.

## NURSERYMEN MEET AT MILWAUKEE IN JUNE

**T**HE various committees which are at work for the convention of the American Association of Nurserymen at Milwaukee in June report that this meeting will be likely to be one of the largest and best in the history of the organization. The program committee is arranging an excellent program, and the entertainment committee will have plenty of diversion for those who attend.

In arranging the program all parts of the country are to be represented. M. McDonald, Salem, Oregon, will discuss "Horticultural Inspection Laws as They Affect Nurserymen," and H. Harold Hume, Glen Saint Mary, Florida, will read a paper on "Semi-Tropical Thoughts for the Nurseryman." The increasing interest in pecan culture, especially in the Southern States, will be recognized by a paper by H. D. Simpson, Vincennes, Indiana, on the subject of "The Pecan." Others who have been asked to take places on the program are Judge Eugene W. Stark, Louisiana, Missouri; J. M. Pitkin, Rochester, New York; D. Hill, Dundee, Illinois; Dr. Jordan of the Geneva (New York) Experiment Station; J. B. Pilkington, Portland, Oregon, and others, so that it is expected that the program will be complete with most excellent papers.

Nurserymen of the Northwestern States are particularly interested in this meeting, and will likely attend in large numbers, for an effort will be made to secure the meeting for Seattle in 1909.

George C. Seager, Rochester, New York, is the secretary of the American Association of Nurserymen, and will be

pleased to furnish information regarding membership which is open to all interested in the nursery business or allied industries. ♦ ♦ ♦

### THE PARAGRAPH PULPIT

(Unitarian)

#### Jesus and Modern Life

Scholarship is now going beneath ecclesiastical creeds and some of the more superficial aspects of scriptural record to the true nature of Jesus and the real and universal purport of His life. He was the supreme prophet of humanity; He was not God assuming humanity; He was rather man achieving divinity; He not only made known God to man, He also made man known to man. He will be the leader of the race not by virtue of miracle or sign, but by virtue of spiritual supremacy. (P. O. M. 346 Yamhill Street, Portland, Oregon).

## APPLE LAND

Near Goldendale, Washington. A newly developing fruit district on the Portland and Seattle Railroad, adjacent to Hood River and The Dalles, Oregon, with the same soil as in the famous Yakima Valley, Washington. Fruit land here equally as good as that in any of the above districts at a much lower price. Unparalleled opportunities for investments. Correspondence solicited

E. H. LEE, Goldendale, Wash.

## Stephens & Hause

### FRUIT LAND

IN SMALL AND LARGE TRACTS near Goldendale, Washington, in one of the best newly developed fruit belts on the Pacific Coast. We also have some choice wheat farms, meadow land and stock ranches for sale.

For information and description write

STEPHENS & HAUSE

Goldendale, Klickitat County, Washington

## HILL

### MILITARY ACADEMY

A BOARDING and Day School for Boys Manual Training, Military Discipline, College Preparation. Boys of any age admitted at any time.

WRITE FOR  
ILLUSTRATED  
CATALOGUE

DR. J. W. HILL  
PROPRIETOR AND PRINCIPAL  
PORTLAND, OREGON



# BLACK Tobacco LEAF Extract KILLS APHIS

Balfour, Guthrie  
& Co. WESTERN AGENTS  
PORTLAND, OREGON

## Perfect Fruit

*Delightful Climate, Beautiful Scenery*

Seventy-two miles east of Portland, six miles east of Hood River, the eastern portion of Hood River fruit district: 15,000 to 20,000 acres fruit land; only 1000 in cultivation, prices \$20 to \$1000 per acre. Produces \$250 to \$500 per acre annually when in full bearing. A climate that is perfect; a soil that is right, and no irrigation gives us fruit that is unsurpassable.

Important—Our apples can be kept all winter and then shipped to any market in the world and still be in good condition. This gives us a market that is never overstocked, regardless of how much is raised in irrigated countries. Many opportunities for good investments. Call on or address

H. E. WAITE, Mosier, Oregon

## Apple Land

On White Salmon Side  
of the Columbia River

*A snap, must sell at once  
Write me*

H. G. MCGOWAN  
201-203 Front St. PORTLAND, OREGON

## STRAWBERRY PLANTS

*That pay to plant are the kind we grow*

We have for this season the largest acreage of plants we ever grew. We have had unusually favorable weather and never grew such a fine lot of strawberry plants. Our supply consists of at least ten million plants of all the leading varieties both old and new. We have shipped a large number of plants the past two seasons to the Northwestern States that have always given satisfaction. We are prepared to fill orders for any amount. We also grow Raspberry, Blackberry, Dewberry and all other small fruit plants, the quality of which is unsurpassed. If you want plants now, write for prices, stating your wants. Our new catalog will be ready to mail about January 1. It is FREE, write for a copy now.

F. W. DIXON, Holton, Kansas

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PORTLAND, OREGON

CAPITAL AND SURPLUS

\$1,500,000.00

No interest paid on accounts

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L. C. Smith & Bros.  
*Typewriter*

(Writing in Sight)

L. & M. Alexander & Co.  
Exclusive Dealers Entire Pacific Coast  
170 Fifth Street, Portland, Oregon

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Hood River Fruit Growers Association,  
Hood River Land Emporium,  
all of Hood River Oregon.

East Hood River Fruit Growers Union,  
Mosier, Oregon.

Ladd & Tilton and Merchants National Bank  
Portland, Oregon.

*Bargains in Traded Out Machines*

Ready for Business  
With a complete stock of  
Fresh and Pure Drugs  
Also fine stock of candies

ALL MATERIALS  
FOR MAKING SPRAY

Nichols Pharmacy  
HOOD RIVER, OREGON

## HEADQUARTERS FOR CENTURY SPRAY PUMPS

Hose, Nozzles, First-  
class Plumbing Supplies

C. F. SUMNER

Successor to Norton & Smith  
HOOD RIVER, OREGON

## The PARIS FAIR

*Hood River's Largest and Best Store*

DRY GOODS  
SHOES, CLOTHING

We are offering some extra specials in  
our Clothing Department. Ask to see them

Try a pair of American Lady  
\$3 & \$3.50 Shoes or American  
Gentlemen \$3.50 & \$4

## Monarch Steel Stump Puller

Pulls stumps  
seven feet in  
diameter



Guaranteed  
500 horse  
power

The only steel stump puller  
factory in the United States  
making their own steel stump  
puller castings. The strongest  
and lightest machine made

Catalogue and discounts, address  
ZIMMERMAN STEEL CO.  
Lone Tree, Iowa



# Ben Levy

Commission Merchant

Washington Street Near Front Portland, Oregon

Consign your strawberries and other small fruits as well as apples and produce to us and receive prompt returns

CAPITAL \$50,000

SURPLUS \$15,000

## FIRST NATIONAL BANK

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## THE DALLES BOX COMPANY

Manufacturers of all kinds of boxes, fruit boxes and berry crates. *Car lots a specialty*

CORRESPONDENCE SOLICITED

P. O. Box 21

Factory: THE DALLES, OREGON

CORRESPONDENCE SOLICITED

## RYAN & NEWTON CO.

Wholesale Fruit and Produce

BUTTE, MONTANA

We have modern cold storage facilities essential for handling your products. A strong house that gives reliable market reports and prompt cash returns

## ROGUE RIVER VALLEY

*Famous for its APPLES, PEARS, PEACHES, GRAPES, MELONS AND CLIMATE*

THE natural home of the Spitzenberg and Newtown apples. Rogue River Pears have led the United States for the past three years in the highest price in the New York market. No peaches of the South excel those of Rogue River, and trees are healthy. Grapes perfection in color and flavor and the best of shippers, and growers have more orders than they can fill. Rogue River cantaloupes, water-melons and cassabas, none better and big money makers. The Grants Pass Fruit Growers Union gets the highest price for fruit, and the Southern Pacific gives terminal rates on shipments East. Climate the perfect medium between arid California and webfoot Oregon. No storms or winds to injure fruit crop. Almonds and figs ripen perfectly and palms grow in the yards. Land yet cheap but will double in two years. Now \$5 to \$100 an acre in small and large tracts, some on easy payments. American community and good schools, rural mails, telephones, etc. Full information by addressing CHARLES MESERVE, Grants Pass, Oregon, Seller of Real Estate in All Parts of Rogue River Valley. References by permission: Grants Pass Fruitgrowers' Union, First National Bank of Southern Oregon.

## FAMOUS HOOD RIVER Strawberries

THE FINEST BERRY ON EARTH AND THE BEST SHIPPER

LOOK GOOD, BUT TASTE BETTER

*Fancy Pack Guaranteed*

FRUIT GROWERS UNION

HOOD RIVER, OREGON

# TREES

We have a magnificent assortment of Fruit Trees, Grapevines, Roses and Ornamental Stock.

Let us figure with you on your requirements in Walnuts, either in grafted or seedling trees.

Write for illustrated Booklet on Burbank's latest creations. Santa Rosa Plum, Rutland Plumcot, Paradox and Royal Walnuts.

Our new descriptive catalogue is a compendium of valuable information. It is free.

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Incorporated Paid up Capital \$200,000  
GEORGE C. ROEDING, President and Manager  
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*Things we are Agents for*

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A GIRLS' SCHOOL OF THE HIGHEST CLASS

CORPS OF TEACHERS, LOCATION, BUILDING, EQUIPMENT THE BEST

Send For Catalogue



## ASHLAND

Largest city in the Rogue River Valley and climatic capital of Southern Oregon. Ideal home town. Unexcelled as a fruit region. Hill and valley fruit lands offer splendid inducements to intelligent and industrious fruit growers.

FOR FURTHER INFORMATION ADDRESS  
**SECRETARY ASHLAND  
COMMERCIAL CLUB**

Ashland, Oregon

## THE ROGUE RIVER VALLEY THE CREAM OF CREATION

Has again demonstrated by the great crop of fruit now set for 1907 that this is the surest in its crop production of any part of America. This fact makes this district look good to the trained horticulturists of all other sections of the Northwest. When it is conceded that orchards approaching the bearing period here are held at less than one-half the figures demanded for similar lands in other districts yielding less net profits than here, it should impress the readers of "Better Fruit" that now is the time to invest in this favored valley, with its regular crops and famous good climate. The homeseeker will get the benefit of more than twenty years' experience in the fruit business by dealing with the

**ROGUE RIVER LAND COMPANY**

EXHIBIT BUILDING

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## MOSIER

*Also called East Hood River*

## FRUIT LANDS

In large or small tracts. Some very good land at low prices at present. Good growing community. Six miles east of Hood River. Also homesteads and relinquishments. Parties wishing to buy will do well to write or see

**GEO. CHAMBERLAIN  
MOSIER, OREGON**

## The Following Comparison Should Satisfy any Horticultural Investor

THAT THIS IS THE BEST PLACE ON EARTH TO PUT HIS MONEY

The owner of a forty-five acre vineyard near Grants Pass has a standing offer of \$1000 per acre; but will not take \$2500 per acre, as his annual returns pay a large interest on that valuation

Raw land equally desirable, adjacent to this vineyard can now be bought for \$25 per acre. If planted to Tokay Grapes in six years this land will be equally as valuable

THIS WOULD MEAN AN INCREASE OF 10,000 PER CENT

For Further Information Address

## THE BEST-FULLER REALTY COMPANY

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## Walnut Land

For the finest in the World  
*Soil & Climate unsurpassed. Address*

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## YAKIMA VALLEY WASHINGTON

We sell improved and unimproved fruit land in the best part of the Yakima Valley. Also "Hanford" land on the Columbia River. For descriptive literature and full information write

## YAKIMA REAL ESTATE CO.

Box A186

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## A Fruit Home in Southern Washington

Take advantage of the low rates to the Pacific Coast and come to White Salmon, Washington. The finest fruit country in the world. Our Newtown and Spitzenberg Apples command the highest prices in the world's markets. Our Strawberries are the earliest in the northwest. The very best fruit land \$25 per acre. Ten acres make a comfortable home and a good living for any family. Located across the Columbia river from Hood River, Oregon.

WRITE US FOR DESCRIPTIVE MATTER AND PRICES

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Established 1900  
Incorporated 1905

## Butler Banking Company

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Capital Fully Paid \$50,000

Deposits over \$400,000

We give special attention to **GOOD FARM LOANS**

If you have money to loan we will find you good Real Estate security or if you want to borrow we can place your application in good hands and we make no charge for this service

*The Managing Officers of this Bank have been residents of Wasco County for more than twenty-five years*

A REPUTATION TO SUSTAIN

## VINELAND NURSERIES COMPANY

PROPAGATORS OF

Reliable Nursery Stock

ALL STOCK BUDED FROM BEARING TREES  
FRUIT AND ORNAMENTAL

CLARKSTON, WASHINGTON

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ESTABLISHED 1859

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TRANSACT A GENERAL BANKING BUSINESS

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## SPITZENBERGS

Of grafts and buds taken from the famous Stewart orchard, President of Washington State Horticultural Society.

SUNNYSIDE NURSERY  
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## Hood River Banking & Trust Co.

HOOD RIVER, OREGON

We Own and Occupy the Finest Equipped and Most Modern Bank in Wasco County

A General Banking and Trust Business Transacted

Safe Deposit Boxes Interest paid on Time and Savings Deposits

Make Our Bank Your Headquarters When in Hood River

Correspondence Invited

Your Patronage Solicited

"THE OLD RELIABLE"

## Albany Nurseries

INCORPORATED

ALBANY, OREGON

We have a complete stock for the coming season. Send in your orders early

Catalogue Free

Salesmen Wanted

Gather your cherries with the only successful

## PATENT PICKER

Having received a large consignment of these pickers by freight from Iowa I am prepared to deliver on receipt of express or postoffice money order for number required. Price, duty and postpaid, two for \$1.50; twelve for \$7.50

### NOTICE TO BRITISH COLUMBIANS

You can gather them much faster; the cherry is not touched by the hand nor bruised. The long, unsightly stem is severed and most of it is left on the tree; hence the fruit looks much more attractive in the box, and is nicer for home use or for market. It also keeps much better and the fruit buds for the next year's crop are not injured. The picker is held in one hand and is operated rapidly and easily, and the other hand is left free to bend the limbs or hold, or anything needed. The device consists of two steel jaws hinged together at the lower end and at the other are two shear-like clipping edges. One of these jaws is movable under the thumb and the other is firmly riveted to the receptacle, which holds about a pint. The device is kept in position by leather keeps for the thumb on one jaw, and for the fingers on the other. Every cherry that is clipped goes into the cup and is secured. The device was thoroughly tested last season, and met with a hearty welcome as filling a long felt need.

JAS. JOHNSTONE, Box 198, Nelson, British Columbia



## Yakima Valley Nursery, Inc.

W. D. INGALLS, Manager

Oldest Yakima Nursery  
Largest stock. Second  
to none in the State

North Yakima, Washington

R. F. D. No. 4



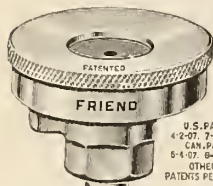


## BURBANK & AMOS

### REAL ESTATE

Irrigated Fruit Lands in the Famous Vale of Cashmere  
The Garden Spot of Washington  
CASHMERE, WASHINGTON

## An Interesting Test of Spraying Nozzles



Recently much time was devoted to the study of spraying outfits and their appliances at Cornell University. All of the leading manufacturers were represented. Professor C. S. Wilson, assistant director, called for a test of the various spray nozzles, Professor Riley, director of farm mechanics, conducting same. The various makes of nozzles, one at a time, were connected to a power sprayer, the pressure at 105 to 110 pounds. The operator would hold the nozzle up where all could see it, making the quality of the spray visible to all; then the nozzle was held over a pail which had been balanced on the scales. At the word of Mr. Riley, who held the watch, the pressure was turned onto the nozzle; the time given was one minute. The nozzles tested were of the leading makes. The first one tested discharged 6 3-4 pounds. It was a Gould; Brown's nozzle next, 7 3-8 pounds; Simplex next, 10 1-16 pounds. The "Friend" the only one marked "patented," which is the original of these large nozzles, doing away with the cluster, came next, discharging 11 3-4 pounds. While this nozzle handled nearly double the solution which the first one mentioned did, still the finest spray was noticeable. It was also noticed that it drove the fine spray farther with much more force.

Much study and experimental work has been going on for years in order to obtain one nozzle of sufficient capacity to do away entirely with the cluster. One pleasing, noticeable feature about the "Friend" was that there was no dripping or clogging. One of the other nozzles drizzled badly. The last one tested was free from all sensitive, internal, moveable parts, which are always subject to dislocation or becoming unmovable by corrosion. This carefully directed test indicates conclusively that the "Friend" came nearest to the requirement. It is manufactured by The "Friend" Manufacturing Company, Gasport, New York. It sells for \$1.55, postpaid. This company is composed of young, live, clean blood, and is setting a lively pace for competitors in the manufacture of spraying outfits and their accessories.

## Throw Old-Style Harrows on the Junk Pile!

**My 2-in-1 Harrow Will Do the Same Work Better in Half the Time—or Don't Keep It. I Take All the Risk**

What's the use going over your fields twice when once over with my Combination Spring and Spike Tooth Harrow will give you a better seed-bed? Think of it—an actual saving of half the time of man and team in preparing your ground. It ought to be mighty interesting to you if it's true, now that hired help is so scarce—and you can prove at my risk that it is true.

### One Man Can Do TWO MEN'S Work

You see, my 2-in-1 Harrow turns up the earth and pulverizes it thoroughly at one operation. You can go once over the furrows with my 2-in-1 Harrow and follow right along with the seeder—thus getting your seed in with no more work and no more time than you now spend harrowing. The book I'll send you tells Why and How.

### My Harrow Saves \$3 a DAY and Pays for Itself in a WEEK

Figuring a low wage for man and team, my 2-in-1 Harrow will save you over \$3 every day you use it—so that it will actually pay for itself in a week—EASY. After that, for years and years, it will pay you better interest than money in a bank. Every farmer who has one of my harrows is en-

thusiastic. You ought to hear them praise it—just as you will after you've tried it and seen what a time and money-saver it is.

### Send it Right Back if It Doesn't Do All I Say

Remember that I hold myself responsible and liable for every statement I have made—and if my harrow doesn't do all I say—or if you just don't like it after a reasonable trial, send it back and get every cent you've paid. If you'd rather have your money than my harrow—it's yours by next mail.

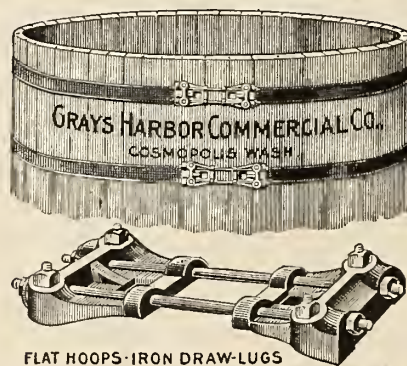
### Big Saving to First Buyer in Each Locality

The first buyer in each locality gets a big reduction for introducing my 2-in-1 Harrow. You can't afford to miss it. Write for my Catalog and big reduction offer anyway. Find out all about this wonderful Harrow. My Catalog gives many good pointers. Write now and be the lucky first buyer among your neighbors.

J. R. NAYLOR  
NAYLOR MFG. CO.  
24 Hillgrove Ave.  
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If you're a Live Dealer and want a Quick Seller—write me.



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If so, you are not justified in buying until you have seen our catalogue. Write us today for delivered price on your requirements

Grays Harbor Commercial Co.  
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Royal Ann, Bing and Lambert Trees and also a complete assortment of Spitzenbergs, Newtowns and other fruit trees

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MONTE VISTA NURSERY  
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First Class Salesmen Wanted

Plant no other. If you want to know WHY, it's because there's no other variety that possesses so many GOOD QUALITIES. Don't simply doubt—investigate for yourself. We have a nice stock of one-year-old trees of this variety and strain for immediate shipment. These trees are all grown from specially selected nuts, grown on GRAFTED TREES. We not only recommend this Vrooman Pure Strain Franquette Walnut, but GUARANTEE it to be just as represented. Accept no variety that is labeled "just as good," for there is none. Remember, we are sole propagators of this particular line of Walnut trees. Ask for free literature describing it. Inquiries cheerfully answered

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## Better Fruit is printed by us

Booklet of Hood River  
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made that cuts  
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PURE PARIS GREEN for Chewing Insects  
CALIFORNIA WASH for San Jose Scale  
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Put up in convenient sizes, and at RIGHT PRICESSend for our booklet, When, Why and How to Spray.  
The Largest Manufacturers of Agricultural Sprays in the U. S.THE JAMES A. BLANCHARD CO.  
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PRICE \$16

F. O. B.

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feet wide, very easy to  
which prevents striking  
No hoeing of trees where  
used on it in orchard,  
fern, pink, sorrel, oats,  
thistle it has no equal.orchards. It is 8 1/4  
guide, has a fender  
the tree with knife.  
used. Two horses  
or for destroying  
briars and CanadaIn using this implement the driver  
will stand in center of board, over knives, and to  
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them may free itself. Keep all of the burrs tight-  
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of shape force them back to place without remov-  
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Grower and Dealer in FRUIT,  
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When you get to Hood River  
stop at the

**MT. HOOD  
HOTEL**

Trains stop directly in front of  
Hotel. ☞ Bus meets all boats

Automobile Service Daily for  
Cloud Cap Inn During Months  
of July, August and September

# THE CIDER BUSINESS IS IT PROFITABLE?

Comparatively no effort has been made either by private enterprise or through the agency of state or federal governments to collect reliable data on cider making. As a result the sources of information on the subject are meagre. Cider making from the standpoint of profitable industry has been regarded by most fruit growers as of less relative importance than poultry raising by the average farmer. It is a fact, however, as a casual investigation will show, that cider making is an industry of great possibilities for profitable investment. Cider of itself is a staple commodity, universally desired. It embodies food elements of the highest nutrient value and in form most easily digested and assimilated by the human body. It contains elements absolutely essential to the proper and healthful functions of various organs of the body. Some of the most eminent physicians and scientists of the United States and Europe have unqualifiedly recommended cider as a healthful food for the strong and a strengthening and invigorating tonic for the weak.

What disposition shall be made of unmarketable apples is a question that annually presents itself to most every American fruit grower. With all the skillful culture and attention possible to grow better fruit, there will always be some apples not equal to the market requirements, and in the mind of each orchardist there is a more or less uncrystallized notion that some use should be made of the "culls." If the facts could be definitely ascertained they would show, no doubt, that hundreds of bushels of apples go to waste each year in every community simply because there is no convenient means of preserving them. About 95 per cent of ripe apples is juice, and by separating the juice from the skin and other hard cellular tissue you have in the juice the only part of the apple that is of real value; the other portion, the pomace, may be thrown away. By using a modern hydraulic press, practically all the juice is obtained, and there is small chance of wasting any of the apple that is of use to man.

Every apple-growing community should have a cider factory; no other business will show such large returns on capital invested and labor required. One of the pioneers in the cider industry writes that a knowledge of its possibilities "suggested to us an absolutely new enterprise—a new industry, involving immense possibilities for personal profit and public usefulness, an unoccupied industrial field in the United States."

There are two general plans of working the cider business: (1) Operating a cider press as a merchant mill; (2) Operating a cider press as a custom mill. A merchant mill does no custom work. The owner works up his own apples, and buys apples in quantities to meet the demands of his trade. In such a mill the cider is prepared for the consumer in form of vinegar, cider beverages, cider syrup and cider jelly.

A Mt. Gilead hydraulic press will produce from one bushel of apples of average quality four and a half gallons of cider. Apples suitable for making cider can be purchased in any year of abundant crop from 10 to 15 cents per bushel. The cost of making cider on a hydraulic press, taking into account labor, interest on investment and all items that properly belong to cost, is indefinitely small, but for the purpose of illustration may be estimated at one-fifth cent per gallon. At \$1.50 each you can buy whisky barrels of fifty gallon capacity. There is comparatively no other expense in the manufacture of either drinking cider or vinegar—heat and air do the work. Cider vinegar is now in great demand at 11 cents per gallon wholesale, and 20 cents retail. Cider beverages are now selling in carload lots at 65 cents per gallon, and the supply is wholly inadequate to meet the demand. To put the business in plain terms:

Cost of apples (eleven bushels) for one barrel of cider.....	\$ 1.65
Cost of making fifty gallons (one barrel) of cider.....	.10
Cost of one barrel.....	1.50
Total cost .....	\$ 3.25
Fifty gallons of vinegar, at 11 cents (wholesale).....	\$ 7.00
Cost .....	3.25
Profit .....	\$ 3.75
Fifty gallons of vinegar, at 20 cents (retail).....	\$10.00
Cost .....	3.25
Profit .....	\$ 6.75
If you retain the barrel (\$1.50) the profit is.....	8.25
Fifty gallons of cider beverage at 65 cents.....	\$32.50
Add to cost \$1 for yeast cultures and \$6 for labor, barrel and other expenses.....	10.25
Profit .....	\$22.25

Investigation will convince any one that the profits on cider manufactured in forms of syrups and jellies with a steam evaporator are equally large. The net profit of a custom mill depends very largely on the size of press used. An average cider-making season in apple-growing communities covers about fifty working days. Custom work varies from 1 cent to 3 cents per gallon, the usual prices being 1½ and 2 cents per gallon.

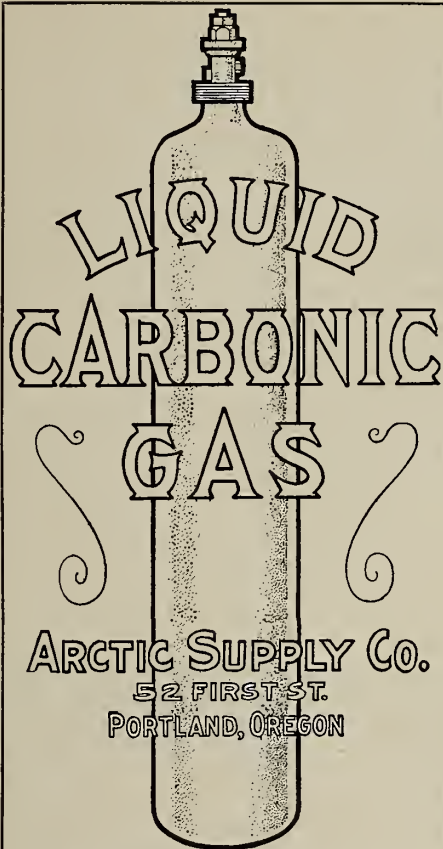
A No. 8 Mt. Gilead hydraulic press has an average capacity of seventy barrels, or 2205 gallons of cider per day.

2205 gallons, at 1½ cents.....	\$ 33.07
Labor and cost of power.....	5.00
Profit .....	\$ 28.07
Fifty days, at \$28.07—Profit for season.....	\$1403.50
At 2 cents per gallon additional.....	551.25
Profit for season.....	\$1954.75

A combination of the custom mill and merchant mill plan is the ideal method of operating the cider business.

The Hydraulic Press Manufacturing Company of Mt. Gilead, Ohio, manufacture the original hydraulic presses in all styles and sizes, hand or power, ranging from 25 to 400 barrels per day, and can supply you with a press that will save you many dollars. The Mt. Gilead hydraulic presses are sold under a positive guarantee to do all they claim for them. It means much to the fruit grower and shows honest, straightforward dealing. They also manufacture steam evaporators, apple-butter cookers, and all appliances used in the cider industry. Write them for catalog No. 60 and any information desired; they will be glad to answer your questions if you mention this paper.





Saves the labor of one man in spraying and does better work

## Pearson's Cement Coated Nails

Are the best for fruit boxes. They are imitated because we advertise them and our product has an established reputation. The imitator has *no reputation* to sustain. *We have.* You never see an advertisement of the imitations. They are *always offered on our reputation.* It stands to reason that our nails are the best, otherwise we could not afford to advertise them. When you ask for PEARSON'S nails see that you get them. *Don't be imposed upon.*

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**A. C. RULOFSON CO.**

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## *The* Codling Moth

and all leaf eating insects are effectually destroyed by

## Swift's Arsenate of Lead

Ordinary rains will not wash it off. No matter how strong it is used, there is absolutely no danger of burning or scorching

*Swift's Arsenate of Lead has Stood the Test of Time*

*It is the Best*

The manufacturers, The Merrimac Chemical Co., of Boston, Massachusetts, have by far the largest and most complete plant in the world for the production of Arsenate of Lead. Their long experience in its manufacture, together with their accumulated knowledge of the needs of fruit growers enables them to turn out a product more uniform and dependable than any other and *far superior* to ordinary commercial Arsenate of Lead

Use "*The Old Reliable Brand*"

*No Other is so Good*

*It Guarantees Your Crop*

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WOODWARD  
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In Southern Washington, opposite Hood River, Oregon, and grow rich. The country that grows the highest priced apples and strawberries in the world's markets. Apples have taken prizes in competition with Hood River fruit. It has the earliest strawberries at the biggest prices along the Columbia River. E. Peck sold \$1200 from four acres of strawberries R. D. Cameron sold \$2000 from two acres of apples. A mild climate pure water. Land is cheap yet but rapidly growing in value. The Mecca of opportunity for investment or a beautiful home.

**R. FIELD & CO.** WHITE SALMON WASHINGTON



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*Will be made this season by the*

OREGON RAILROAD  
& NAVIGATION CO.  
*AND*  
SOUTHERN PACIFIC  
LINES IN OREGON

*From Portland, Oregon, as follows:*

TO	BOTH WAYS THROUGH PORTLAND	ONE WAY VIA CALIFORNIA
Chicago . . .	\$72.50	\$87.50
St. Louis . . .	67.50	82.50
St. Paul . . .	63.15	81.75
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Good for return in ninety days with stop-  
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WM. McMURRAY

General Passenger Agent

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## Ideal Fruit & Nursery Co.

We have for fall and spring delivery a full line of absolutely true to name and free from all pests all the leading varieties of

Apples, Pears, Cherries, Prunes,  
Plums, & Small Fruits of all Kinds

We invite inspection at any time  
Prices furnished on application

Guignard & Rosiger, Hood River, Oregon

Buy and Try

## WHITE RIVER FLOUR

MAKES

WHITER, LIGHTER BREAD

## Niagara Lime and Sulphur Solution

For San Jose Scale, and Scale Insects or Bark Lice, Aphid and Woolly Aphid, Leaf Curl of Peach, Moss, Mildew and all pests for which Lime and Sulphur has been found a remedy. Niagara is the **only spray made which is tested and has that test marked on every barrel.** It is a perfectly made, clear, highly concentrated liquid, capable of being diluted with eleven times its quantity of water for San Jose Scale. The following are a few of the many who are using or handling Niagara because it is the best:

J. A. Perry, Rogue River Fruit Growers' Union, Medford, Oregon; Lane County Fruit and Vegetable Growers' Association, Eugene, Oregon; Stranahan & Clark, Hood River, Oregon; Chase & Kaife, Salem, Oregon; Wenatchee Produce Company, Wenatchee, Washington; Yakima Hardware Company, North Yakima, Washington; Yakima Valley Fruit and Produce Growers' Association, Granger, Washington; Zillah Fruit Growers' Association, Toppenish, Washington; Blalock Fruit Company, Walla Walla, Washington; Malheur Mercantile Company, Ontario, Oregon; British Columbia Fruit Growers' Association, W. J. Brandrith, Manager, Ladner, British Columbia; Western Hardware and Implement Company, Lewiston, Idaho; Milton Fruit Growers' Union, Milton, Oregon; A. E. Crosby, Druggist, The Dalles, Oregon.

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Is incomplete without a ride  
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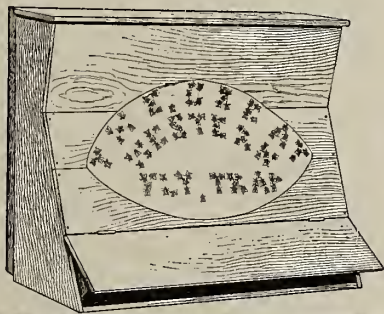
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DEALERS IN

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W. H. Grasser of Clarkston, Washington, is putting the greatest

## INSECT TRAP



On the market that has ever been known. It will successfully catch the pestful yellow jackets, codling moth, army worm flies, nearly all insects that inhabit the orchard as well as the common house fly. Just bait the trap with crushed fruit and set it on a stump or dry-goods box in the orchard and you will get them. This trap has won first prize wherever shown at a fair. You will be surprised to see the amount and kinds of insects this trap will catch

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LIGHT AND POWER BUSINESS

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City Water Works System for Domestic and Municipal Use.  
Are prepared to furnish 3000 Horse Power, either  
Electric or Water, at Reasonable Rates

General Office, HOOD RIVER, OREGON

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Who wish to produce an apple which will keep two months longer than apples grown along the Columbia River, come to Baker City and investigate the famous Sunnyslope bench lands. Write for particulars to the

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DO YOU LIKE FRUIT? Apples, Cherries, Berries,  
Peaches, Prunes, and Melons and all kinds of delicious fruit?

## Buy Land in Payette Valley IDAHO

"Make Hay Where the Sun Shines." The best sugar beet land in the world. Three crops of alfalfa each year, producing from seven to nine tons per acre

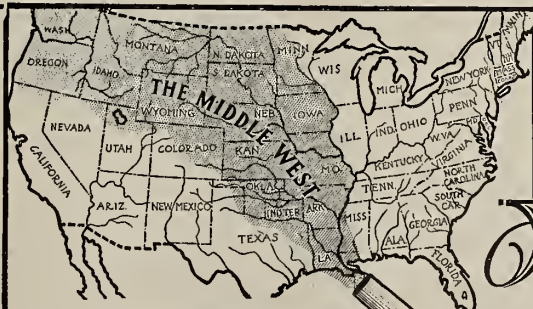
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Are you spraying? Getting best results? Have you tried the Dust method? If not you will do well to heed the opinion of those about you. This is past the experimental stage

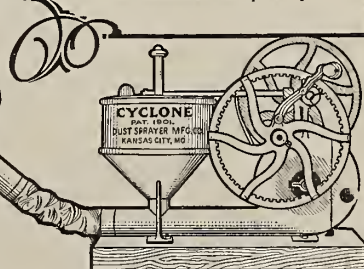


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## Morgan & McKaig

Distributors for the Northwest  
NORTH YAKIMA, WASHINGTON

Many hundreds of progressive and successful fruit growers in all parts of the world and nearly every fruit growing district in Washington, Oregon, Idaho and British Columbia have used the Dust Sprayer with success the past year







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## Southern Oregon Investment Co.

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Our Newtown Pippins are fine quality,  
keep better, and bring the highest price.  
Pear orchard net yield \$500 per acre.  
Land finely located \$30 per acre and  
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ORDER YOUR

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is the "ever-ready kind"—made to do service and *last*.

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respond every time they're called on—no waiting to "fix up" a  
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Our new Nineteen Eight Catalogue and "Expert Testimony"  
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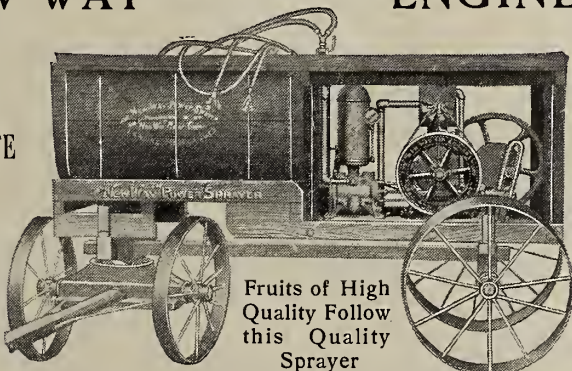


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Carries high pressure without the usual vibration and strain, and is the most practical, durable and economical machine ever built for spraying. Use your own running gear if you prefer. Write us today for Spray Catalogue No. S-8



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Near the mouth of the Columbia River, on the Washington Side, reached from the City of Portland on the splendid excursion

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In about six hours. It is upward of twenty miles long, very broad and level and almost as compact as a composition pavement. It is dotted its entire length with towns, cottage settlements, tent cities, villas, fine hotels and all the amusement accessories of a popular summer beach resort. It's the place to go for rest, health and a good time. Thousands go there for their summer outing. *Try it*

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Purchase tickets and make reservations at city ticket office, Third and Washington Streets, Portland, or inquire of any O. R. & N. agent elsewhere for information

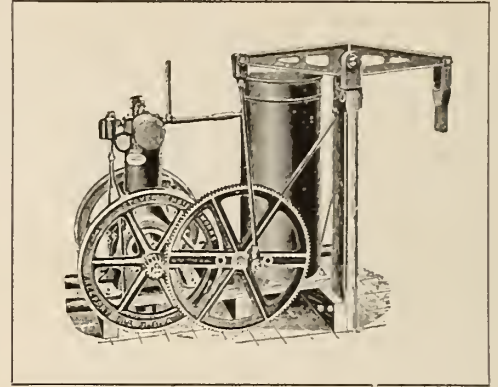
**WM. McMURRAY**

General Passenger Agent

PORTLAND, OREGON



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LEWIS & STAYER CO.

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Water for domestic use, for sawing wood, grinding feed and all the varied uses. *It has no superiors and few equals.* We carry a large stock of extras and repair parts to take care of you in case of accident. *This feature is worth \$ to you*

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10,000 cases Cherries.

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Two canneries in oper-  
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450,000 barrels Flour.

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Early vegetables of all kinds put on the Portland market  
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The county seat of Wasco County, is a thriving wide-awake city of 5000 inhabitants, located on the Columbia River with two through line railroads, one on either side of the river. The city boasts of its fine streets and beautiful homes and is proud of its great variety of resources. 3000 horse-power electric plant operating flouring mills, planing mills, box factories machine shops, etc., and endless supply of water power within easy reach. The finest country in the world for air seasoning and wood manufacturing.

*The Columbia River Scenery and Eastern Oregon Climate is Unequaled in the World*

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**THE DALLES BUSINESS MEN'S ASSOCIATION**

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A SHIPPER wrote us once: "I accumulated twenty thousand dollars, went into the fruit and produce business and through ignorance of credits, *I shipped it all away.*" Many a crop has been "*shipped away.*" What system or safeguards are you using? "Draft on Bill of Lading" is no protection if your customer "refuses" the shipment. Send for free booklet explaining our service and ask us for names of shippers who know us, whether we are reliable and capable. Don't rely on general mercantile agencies, but use a *special* agency that fits your requirements. *It, at least, is worth your investigation, and now is the time to do it, before your active shipping season begins.* Then you will be "too busy," and first thing you know you will make a big loss that could have been easily avoided if you "had only known the experience of other shippers," or if you had had a *Produce Reporter Adjuster* at destination to protect your interests. *Do it now*

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# WHITE SALMON VALLEY

WASHINGTON

Across the Columbia River From

## HOOD RIVER VALLEY

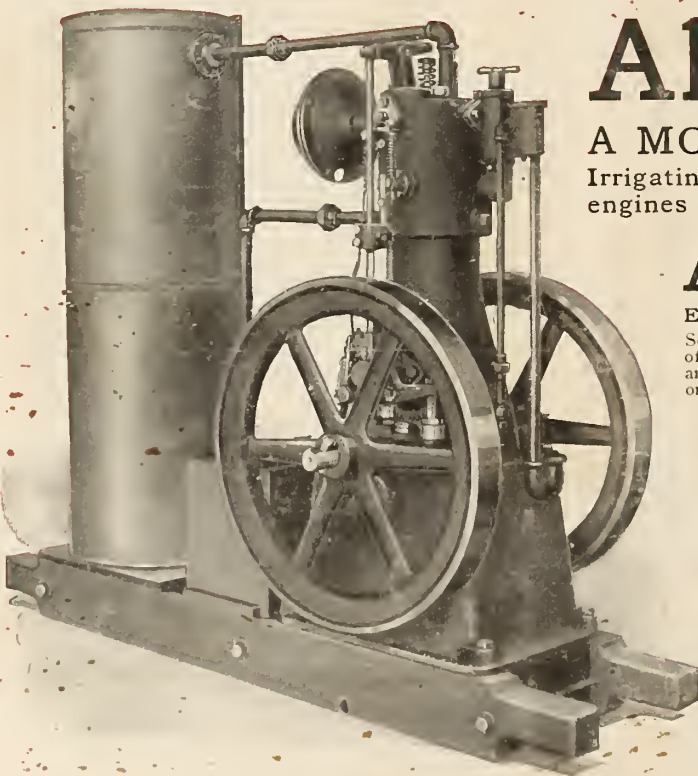
OREGON

### The Banner Apple Belts of the World

The name White Salmon Valley is given to that part of Klickitat County drained by the White Salmon River. It extends from the north bank of the Columbia River to the foothills of Mount Adams, a distance of thirty miles. It lies opposite Hood River, in the same climatic belt. The soil is a deep volcanic ash with a clay subsoil. No hardpan. As the snows of Mount Hood influence the Hood River Valley, producing the finest apples in Oregon, so do the snows of Mount Adams influence the White Salmon Valley, producing the finest apples in Washington. These two valleys are destined to become the greatest apple belt in the world. Our berries and all fruits are grown without irrigation; the yield is large and the fruit of a beautiful color, rich in flavor and aroma, and of a superior shipping and keeping quality.

The valley has been held back heretofore through lack of railroad facilities, but the Spokane, Portland & Seattle Railroad, just completed, gives this valley the best shipping facilities in the West. There are thousands of acres of the richest unimproved berry and apple land that may be bought for \$40 to \$100 per acre. Land when improved will clear from \$300 to \$750 per acre in berries and apples. The valley is rapidly developing. NOW IS THE TIME TO SECURE A CHOICE ORCHARD TRACT AT A LOW FIGURE. For full particulars of this wonderful valley address the

WHITE SALMON COMMERCIAL CLUB WHITE SALMON  
WASHINGTON



## Alamo Engine

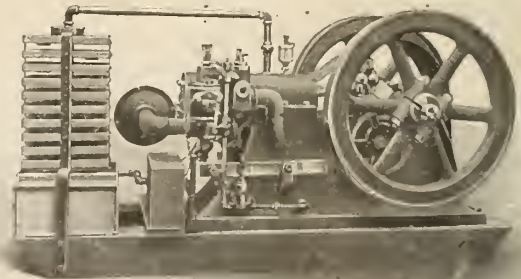
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Irrigating, spraying and farm work. Special portable engines for hay press duty. See others but not until you see us

## Alamo Gas Engine

Easiest started, smoothest running, most durable, least fuel required

Some engines require a wizard or mechanical expert to get any work out of them. The Alamo is easily operated. Its mechanism is readily mastered, and any bright boy or man can run one. It is the most economical engine on the market, suitable for every kind of farm work. Sizes one and one-half horsepower to fifty horsepower



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